

**Elektrotechnický ústav SAV, v. v. i.**



**Správa o činnosti organizácie SAV  
za rok 2022**

Bratislava  
január 2023

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## 1. Základné údaje o organizácii

### 1.1. Kontaktné údaje

**Názov:** Elektrotechnický ústav SAV, v. v. i.

**Riaditeľ:** RNDr. Vladimír Cambel, DrSc.

**1. zástupca riaditeľa:** Ing. Milan Ťapajna, PhD.

**2. zástupca riaditeľa:** Ing. Ján Fedor, PhD

**Vedecký tajomník:** RNDr. Marianna Španková, PhD

**Predseda vedeckej rady:** RNDr. Dagmar Gregušová, DrSc.

**Člen Snemu SAV:** Ing. Milan Ťapajna, PhD.

**Adresa:** Dúbravská cesta 9, 841 04 Bratislava

<http://www.elu.sav.sk>

**Tel.:** 02/ 5922 2555

**E-mail:** elusav@savba.sk

**Názvy a adresy organizačných zložiek a detašovaných pracovísk:**

Organizačné zložky: nie sú

Detašované pracoviská:

- **Oddelenie mikroelektroniky a senzoriky**  
Vrbovská cesta 110, 921 01 Piešťany

**Vedúci organizačných zložiek a detašovaných pracovísk:**

Organizačné zložky: nie sú

Detašované pracoviská:

- **Oddelenie mikroelektroniky a senzoriky**  
Mgr. Bohumír Zaťko, PhD

**Členovia Snemu SAV za organizačné zložky:**

nie sú

**Typ organizácie:** Verejná výskumná inštitúcia od roku 2022

### 1.2. Údaje o zamestnancoch

Tabuľka 1a Počet a štruktúra zamestnancov

| Štruktúra zamestnancov     | K   | K  |    | K<br>do 35<br>rokov |   | F   | P     | T     | O   |
|----------------------------|-----|----|----|---------------------|---|-----|-------|-------|-----|
|                            |     | M  | Ž  | M                   | Ž |     |       |       |     |
| Celkový počet zamestnancov | 113 | 81 | 32 | 21                  | 6 | 112 | 87.21 | 68.02 | 7.4 |

|   |    |    |    |    |   |    |       |       |     |
|---|----|----|----|----|---|----|-------|-------|-----|
| <b>Vedeckí pracovníci</b>   | 61 | 51 | 10 | 9  | 2 | 60 | 49.31 | 48.31 | 0   |
| <b>Odborní pracovníci VŠ</b><br>(výskumní a vývojoví zamestnanci <sup>1</sup> ) | 25 | 18 | 7  | 11 | 4 | 25 | 13.11 | 13.11 | 0.3 |
| <b>Odborní pracovníci VŠ</b><br>(ostatní zamestnanci <sup>2</sup> )             | 6  | 2  | 4  | 0  | 0 | 6  | 5.15  | 0.5   | 1   |
| <b>Odborní pracovníci ÚS</b>  | 16 | 8  | 8  | 1  | 0 | 16 | 14.59 | 6.1   | 6.1 |
| <b>Ostatní pracovníci</b>   | 5  | 2  | 3  | 0  | 0 | 5  | 5.05  | 0     | 0   |

<sup>1</sup> odmeňovaní podľa 553/2003 Z.z., príloha č. 5<sup>2</sup> odmeňovaní podľa 553/2003 Z.z., príloha č. 3 a č. 4

*K – kmeňový stav zamestnancov v pracovnom pomere k 31.12.2022 (uvádzať zamestnancov v pracovnom pomere, vrátane riadnej materskej dovolenky, zamestnancov pôsobiach v zahraničí, v štátnych funkciách, členov Predsedníctva SAV, zamestnancov pôsobiach v zastupiteľských zboroch)*

*F – fyzický stav zamestnancov k 31.12.2022 (bez riadnej materskej dovolenky, zamestnancov pôsobiach v zahraničí v štátnych funkciách, členov Predsedníctva SAV, zamestnancov pôsobiach v zastupiteľských zboroch)*

*P – celoročný priemerný prepočítaný počet zamestnancov*

*T – celoročný priemerný prepočítaný počet riešiteľov projektov*

*O – celoročný priemerný prepočítaný počet obslužného personálu podieľajúceho sa na riešení projektov (technikov, laborantov, projektových manažérov a pod.) mimo zamestnancov v administratívnej, správe a údržbe budov, upratovačiek, vodičov a pod.*

*M, Ž – muži, ženy*

Tabuľka 1b Štruktúra vedeckých pracovníkov (kmeňový stav k 31.12.2022)

| <b>Rodová skladba</b> | <b>Pracovníci s hodnosťou</b> |                  |              |             | <b>Vedeckí pracovníci v stupňoch</b> |              |              |
|-----------------------|-------------------------------|------------------|--------------|-------------|--------------------------------------|--------------|--------------|
|                       | <b>DrSc.</b>                  | <b>CSc./PhD.</b> | <b>prof.</b> | <b>doc.</b> | <b>I.</b>                            | <b>II.a.</b> | <b>II.b.</b> |
| <b>Muži</b>           | 8                             | 40               | 0            | 4           | 8                                    | 30           | 13           |
| <b>Ženy</b>           | 2                             | 8                | 0            | 1           | 2                                    | 5            | 3            |

Tabuľka 1c Štruktúra pracovníkov podľa veku a rodu, ktorí sú riešiteľmi projektov

| <b>Veková štruktúra (roky)</b> | <b>&lt; 31</b> |          | <b>31-35</b> |          | <b>36-40</b> |          | <b>41-45</b> |          | <b>46-50</b> |          | <b>51-55</b> |          | <b>56-60</b> |          | <b>61-65</b> |          | <b>&gt; 65</b> |          |
|--------------------------------|----------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|----------------|----------|
|                                | <b>A</b>       | <b>B</b> | <b>A</b>     | <b>B</b> | <b>A</b>     | <b>B</b> | <b>A</b>     | <b>B</b> | <b>A</b>     | <b>B</b> | <b>A</b>     | <b>B</b> | <b>A</b>     | <b>B</b> | <b>A</b>     | <b>B</b> | <b>A</b>       | <b>B</b> |
| <b>Muži</b>                    | 13             | 7.6      | 10           | 8.6      | 9            | 7.3      | 9            | 8.8      | 4            | 3.8      | 2            | 2.0      | 3            | 3.0      | 4            | 3.4      | 19             | 12.1     |
| <b>Ženy</b>                    | 4              | 1.3      | 2            | 1.8      | 2            | 2.0      | 2            | 2.0      | 0            | 0.0      | 1            | 1.0      | 2            | 2.0      | 4            | 4.0      | 2              | 1.2      |

*A - Prepočet bez zohľadnenia úväzkov zamestnancov*

*B - Prepočet so zohľadnením úväzkov zamestnancov*

Tabuľka 1d Priemerný vek zamestnancov organizácie k 31.12.2022

|              | <b>Kmeňoví zamestnanci</b> | <b>Vedeckí pracovníci</b> | <b>Riešitelia projektov</b> |
|--------------|----------------------------|---------------------------|-----------------------------|
| <b>Muži</b>  | 48.2                       | 49.2                      | 47.3                        |
| <b>Ženy</b>  | 52.3                       | 49.5                      | 47.2                        |
| <b>Spolu</b> | 49.4                       | 49.2                      | 47.3                        |

### **1.3. Iné dôležité informácie k základným údajom o organizácii a zmeny za posledné obdobie (v zameraní, v organizačnej štruktúre a pod.)**

Národná rada SR schválila dňa 21. 9. 2021 zákon č. 347/2021 Z. z., podľa ktorých odo dňa 1. 1. 2022 sa právna forma organizácií akademie zmenila na verejné výskumné inštitúcie.

Na základe tohto zákona si Elektrotechnický ústav, vedecko-výskumná inštitúcia (skrátene v.v.i.) zvolila svoju Správnu radu v zložení:

RNDr. Vladimír Cambel, DrSc. – predseda SR

Ing. Jozef Fabian, CSc.

Ing. Ján Fedor, PhD

RNDr. Marianna Španková, PhD.

Ing. Milan Ťapajna, PhD.

a PSAV zvolilo Dozornú radu EIÚ SAV, v.v.i.:

prof. RNDr. Peter Samuely, DrSc. – Predseda DR

prof. Ing. Viera Stopjaková, PhD.

Ing. Romana Jurkiewiczová

Na jeseň prebehli voľby do Vedeckej rady podľa nových pravidiel, organizovala ich Správna rada. Členmi VR sa stali:

Interní členovia:

RNDr. Dagmar Gregušová, DrSc. –predsedníčka

Ing. Filip Gucmann, PhD. – podpredseda

Ing. Boris Hudec, PhD. – tajomník

doc. Ing. Fedor Gömöry, DrSc.

Dr. rer. nat. Martin Hulman

Mgr. Enric Pardo, PhD.

Mgr. Michaela Sojková, PhD.

Externí členovia:

doc. Ing. Peter Bokes, PhD.

Ing. Roman Lupták, PhD.

doc. Ing. Miroslav Mikolášek, PhD.

doc. RNDr. Tomáš Plecenik, PhD.

## 2. Vedecká činnosť

### 2.1. Domáce projekty

Tabuľka 2a Domáce projekty riešené v roku 2022

| ŠTRUKTÚRA PROJEKTOV  | Počet |    | Čerpané financie (€) |                 |                 |                 |                |                 |
|--|-------|----|----------------------|-----------------|-----------------|-----------------|----------------|-----------------|
|  | A     | B  | A                    |                 |                 |                 | B              |                 |
|  |       |    | Zo zdrojov SAV       |                 | Z iných zdrojov |                 | Zo zdrojov SAV | Z iných zdrojov |
|  |       |    | Spolu                | Pre organizáciu | Spolu           | Pre organizáciu |                |                 |
| <b>1. Projekty VEGA</b>  | 13    | 1  | -                    | -               | 144498          | 144498          | -              | 3801            |
| <b>2. Projekty APVV</b>  | 14    | 11 | -                    | -               | 523256          | 380711          | -              | 185086          |
| <b>3. Projekty EŠIF/OP ŠF</b>  | 1     | 1  | -                    | -               | 35645           | 35645           | 47612          | -               |
| <b>4. Projekty SASPRO, MoRePro, IMPULZ</b>   | 1     | 0  | 44448                | 44448           | -               | -               | -              | -               |
| <b>5. Iné projekty (FM EHP, Vedecko-technické projekty, na objednávku rezortov a pod.)</b> | 2     | 0  | 2000                 | 2000            | -               | -               | -              | -               |

A - organizácia je nositeľom projektu

B - organizácia sa zmluvne podieľa na riešení projektu

Tabuľka 2b Domáce projekty podané v roku 2022

| Štruktúra projektov                            | Miesto podania | Organizácia je nositeľom projektu | Organizácia sa zmluvne podieľa na riešení projektu |
|--|----------------|-----------------------------------|--|
| <b>1. Účasť na nových výzvach APVV r. 2022</b> | -              | 3                                 | 3  |
| <b>2. Projekty výziev EŠIF podané r. 2022</b>  | Bratislava     |                                   |  |
|  | Regióny        |                                   |  |

**2.2. Medzinárodné projekty****2.2.1. Medzinárodné projekty riešené v roku 2022**

Tabuľka 2c Medzinárodné projekty riešené v roku 2022

| ŠTRUKTÚRA PROJEKTOV  | Počet |   | Čerpané financie (€) |                 |                 |                 |                |                 |
|--|-------|---|----------------------|-----------------|-----------------|-----------------|----------------|-----------------|
|  | A     | B | A                    |                 |                 |                 | B              |                 |
|  |       |   | Zo zdrojov SAV       |                 | Z iných zdrojov |                 | Zo zdrojov SAV | Z iných zdrojov |
|  |       |   | Spolu                | Pre organizáciu | Spolu           | Pre organizáciu |                |                 |
| <b>1. Projekty Horizont 2020 a Horizont Európa</b>                   | 0     | 6 | -                    | -               | -               | -               | 7000           | 13889           |
| <b>2. Projekty ERA.NET, ESA, JRP</b>                                 | 0     | 1 | -                    | -               | -               | -               | 25000          | -               |
| <b>3. Projekty COST</b>  | 0     | 3 | -                    | -               | -               | -               | 5833           | -               |
| <b>4. Projekty EUREKA, NATO, UNESCO, CERN, IAEA, IVF, ERDF a iné</b> | 0     | 3 | -                    | -               | -               | -               | -              | 102872          |
| <b>5. Projekty v rámci medzivládnych dohôd</b>                       | 0     | 0 | -                    | -               | -               | -               | -              | -               |
| <b>6. Bilaterálne projekty MAD, Mobility, Open Mobility</b>          | 0     | 0 | -                    | -               | -               | -               | -              | -               |
| <b>7. Bilaterálne projekty ostatné</b>                               | 5     | 0 | 9567                 | 9567            | -               | -               | -              | -               |
| <b>8. Podpora MVTS z národných zdrojov okrem SAV (APVV a iné)</b>    | 0     | 0 | -                    | -               | -               | -               | -              | -               |
| <b>9. SAS-UPJŠ ERC Visiting Fellowship Grants</b>                    | 0     | 0 | -                    | -               | -               | -               | -              | -               |
| <b>10. Iné projekty</b>  | 0     | 0 | -                    | -               | -               | -               | -              | -               |

A - organizácia je nositeľom projektu

B - organizácia sa zmluvne podieľa na riešení projektu

**2.2.2. Medzinárodné projekty Horizont Európa podané v roku 2022**

Tabuľka 2d Počet projektov Horizont Európa v roku 2022

|   | A | B |
|---|---|---|
| <b>Počet podaných projektov Horizont Európa</b> | 1 |   |

*A - organizácia je nositeľom projektu*

*B - organizácia sa zmluvne podieľa na riešení projektu*

*Údaje k domácim a medzinárodným projektom sú uvedené v Prílohe B.*

### **2.2.3. Zámery na čerpanie Európskych štrukturálnych a investičných fondov v ďalších výzvach**

### **2.3. Výber najvýznamnejších výsledkov vedeckej práce organizácie v roku 2022**

*Slúži aj na výber výsledkov do výročnej správy SAV. Každý výsledok má byť charakterizovaný stručným, všeobecne zrozumiteľným popisom – maximálne 1000 znakov + 1 obrázok; bibliografický údaj uvádzajte rovnako ako v zozname publikačnej činnosti, vrátane IF. Nadpis by mal vystihnúť prínos a význam výsledku – podľa možnosti by nemal byť zredukovaný na názov/nadpis publikačného výstupu.*

#### **2.3.1. Výsledky na báze základného výskumu**

**Názov:** Nový dvojrozmerný materiál: CuI

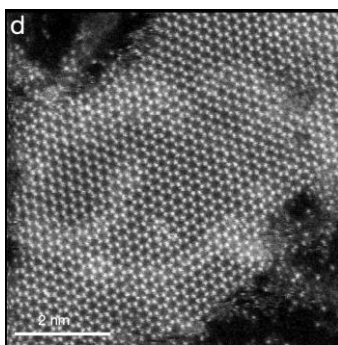
**Riešitelia:** V. Skákalová, M. Hulman a P. Kotrusz

**Projekt:** APVV-19-0365 (zodp. riešiteľ M. Hulman)

Súčasný 2D materiál primárne pochádzajú z van der Waalových (vdW) vrstvených objemových štruktúr. Za normálnych laboratórnych podmienok však existuje len obmedzený počet takýchto štruktúr a celkovo bolo úspešne syntetizovaných alebo exfoliovaných iba niekoľko desiatok 2D kryštálov. Jedným z potenciálnych 2D materiálov, z množstva predpovedaných, je beta-fáza jodidu meďnatého (CuI), ktorá je však stabilná len v úzkom teplotnom rozmedzí od 645 K do 675 K.

Naša práca predstavuje novú metódu na stabilizáciu jednej vrstvy beta-CuI pomocou enkapsulácie medzi dve grafénové vrstvy za izbovej teploty a bežných laboratórnych podmienok. Tento nový 2D materiál sa syntetizuje priamo medzi vrstvami grafénu jednostupňovou mokrou chemickou metódou. Pomocou pokročilých experimentálnych techník sme komplexne charakterizovali jeho atómovú konfiguráciu a potvrdili stabilitu získanej heteroštruktúry pomocou výpočtov metódou funkcionálu hustoty.

Vzorky boli syntetizované v našom laboratóriu a charakterizované technikami elektrónovej mikroskopie na univerzitách vo Viedni, Tübingene a Antverpách. Medzitým sme už použili rovnaký proces na výrobu 2D kryštálov jodidu striebra (AgI) a niklu ( $\text{NiI}_2$ ). Zovšeobecnenie tohto experimentálneho prístupu by mohlo viesť k syntéze ďalších exotických vrstvených štruktúr, čím sa výrazne rozšíri v súčasnosti dostupná knižnica 2D materiálov.



Obr. Snímok dvojrozmerného kryštálu CuI zo skenovacieho transmisného elektrónového mikroskopu.



**Publikácia:**

MUSTONEN, K.\*\* - HOFER, C. - KOTRUSZ, P. - MARKEVICH, A. - HULMAN, Martin - MANGLER, C. - SUSI, T. - PENNYCOOK, T.J. - HRICOVÍNI, K. - RICHTER, C. - MEYER, J.C. - KOTAKOSKI, J.\*\* - SKÁKALOVÁ, V.\*\*. Towards exotic layered materials: 2D cuprous iodide. In Advanced Materials, 2022, vol. 34, no. 2106922. (2021: 32.086 - IF, Q1 - JCR, 8.663 - SJR, Q1 - SJR). ISSN 0935-9648. Dostupné na: <https://doi.org/10.1002/adma.202106922> Typ: ADCA

**Názov:** Supravodivé elektromotory pre lietadlá poháňané vodíkom

**Riešitelia:** E. Pardo, J. Kováč, A. Dadhich, M. Mošat', R. Ries, M. Solovyov, J. Šouc, L. Kopera, T. Melišek

**Projekt:** APVV-19-0536, Horizon2020, No. 723119 (ASuMED)

Komerčná letecká doprava je významným zdrojom narastajúcich emisií skleníkových plynov (CO<sub>2</sub>, NO<sub>x</sub>, H<sub>2</sub>O vo vysokých nadmorských výškach). Medzinárodná asociácia leteckej dopravy (IATA) si dala za cieľ bezemisnú leteckú dopravu v západných krajinách do roku 2050. Supravodivé elektrické motory umožňujú pohon elektrických lietadiel a lietadiel na báze vodíka s nulovými emisiami. Obzvlášť sľubným konceptom je práve druhý menovaný, keďže kvapalný vodík s teplotou 20K je možné súčasne použiť ako chladiace médium pre supravodivé časti motora. Na našom ústave sme vybudovali unikátny experimentálny systém na meranie striedavých strát v supravodivých REBCO vinutiach v satoroch motorov až do teploty 20 K. Keďže produktom akýchkoľvek strát je teplo, je nevyhnutná ich minimalizácia pre udržanie supravodivých vinutí v motore na nízkych teplotách (medzi 20 a 40 K). V rozpore s očakávaniami, merania ukázali, že pre straty cievky je dominantný zvyškový magnetizmus substrátu [1], čím sme na tento problém upozornili výrobcov supravodivých pásov.

Taktiež sme pracovali na konceptoch znižovania efektov demagnetizácie priečného poľa v rotoroch vyrobených zo supravodivých zväzkov pásov REBCO [2], ktoré pôsobia ako silné permanentné magnety.

**Publikácie:**

[1] KOVÁČ, Ján - KOPERA, Ľubomír - PARDO, Enric\*\* - MELIŠEK, Tibor - RIES, Rastislav - BERBERICH, E. - WOLFSTÄDLER, S. - RIES, T. Measurement of AC loss down to 25 K in a REBCO racetrack coil for electrical aircraft motor. In Scientific Reports, 2022, vol. 12, no. 16454. (2021: 4.997 - IF, Q2 - JCR, 1.005 - SJR, Q1 - SJR). ISSN 2045-2322. Dostupné na: <https://doi.org/10.1038/s41598-022-20625-6> (APVV 19-0536. VEGA 2/0036/21) Typ: ADCA

[2] DADHICH, Anang - LI, S. - SOLOVYOV, Mykola - ŠOUC, Ján - MOŠAŤ, Marek - PARDO, Enric\*\*. Reducing cross-field demagnetization of superconducting stacks by soldering in pairs. In Superconductor Science and Technology, 2022, vol. 35, no. 115001. (2021: 3.482 - IF, Q2 - JCR, 0.826 - SJR, Q1 - SJR). ISSN 0953-2048. Dostupné na: <https://doi.org/10.1088/1361-6668/ac908f> (APVV 19-0536. VEGA 2/0036/21) Typ: ADCA

### 2.3.2. Výsledky aplikačného typu

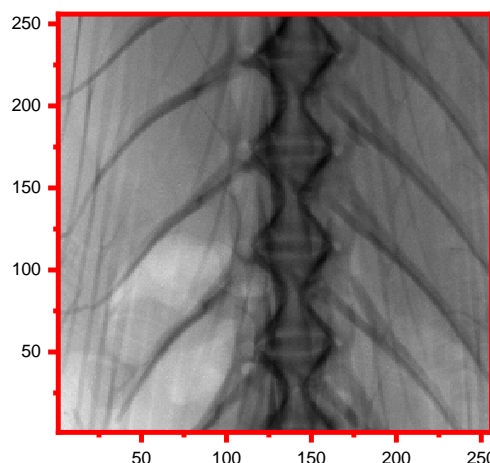
**Názov:** Timepix3 radiačná kamera s využitím pixelového senzora na báze karbidu kremíka

**Riešitelia:** B. Zaťko, N. Gál, J. Osvald, P. Boháček, E. Kováčová  
(Realizátor ADVACAM Praha)

**Projekt:** APVV-18-0273

V rámci APVV projektu sme vyvinuli a pripravili pixelové senzory na báze 4H-SiC vysokokvalitnej epitaxnej vrstvy. SiC je perspektívny polovodičový materiál, ktorý má viacero výhod. Je to širokopásmový polovodič, ktorý je schopný pracovať až pri teplotách niekoľko sto stupňov Celzia. Okrem toho je aj vysoko radiačne odolný a tým vhodný ako senzor ionizujúceho

žiarenia, najmä neutrónov a ťažkých nabitých častíc. Pripravili sme pixelové senzory optimalizované pre vyčítavací čip typu Timepix vyvinutý v CERNe. Detekčná časť sa skladá z  $256 \times 256$  pixelov celkovej plochy  $14,1 \times 14,1 \text{ mm}^2$ . Pre vyčítavaciu elektroniku typu Timepix sme sa rozhodli, pretože umožňuje viacero typov spracovania signálov z pixelového senzora. Okrem bežného zobrazovacieho módu je k dispozícii aj spektrometrický mód, v ktorom vieme identifikovať energetické spektrum dopadajúceho ionizujúceho žiarenia a tiež časový mód, kde môžeme jednotlivé pixelové udalosti rozlišovať s časovou presnosťou až 1.2 ns. V spolupráci s firmou ADVACAM (Praha) boli po prvýkrát na svete pripravené 2 prototypy plne funkčných radiačných kamier na báze 4H-SiC senzora (obrázok vľavo). Obrázok vpravo ukazuje rtg obraz kostry sardinky, ktorý je kvalitatívne porovnateľný s obdobnými dostupnými kamerami na báze Si senzora. Využitie SiC kamery sa predpokladá hlavne pri detekcii neutrónov alebo pri zobrazovaní pomocou neutrónov, čo je doplnková aplikácia k rtg zobrazovaniu.



Vľavo: prototyp Timepix3 radiačnej kamery s SiC senzorom

Vpravo: rtg obraz kostry sardinky zosnímaný vyvinutou novou radiačnou kamerou.

#### Publikácia:

ZAŤKO, Bohumír\*\* - ŠAGÁTOVÁ, A. - GÁL, Norbert - NOVÁK, A. - OSVALD, Jozef - BOHÁČEK, Pavol - POLANSKY, Š. - JAKUBEK, J. - KOVÁČOVÁ, Eva. From a single silicon carbide detector to pixelated structure for radiation imaging camera. In Journal of Instrumentation, 2022, vol. 17, no. C12005. (2021: 1.121 - IF, Q4 - JCR, 0.428 - SJR, Q2 - SJR, karentované - CCC). (2022 - Current Contents, WOS, SCOPUS). ISSN 1748-0221. Dostupné na: <https://doi.org/10.1088/1748-0221/17/12/C12005> Typ: ADCA

### 2.3.3. Výsledky na báze medzinárodnej spolupráce

**Názov:** 3D ploter na báze nanášania po atómových vrstvách

**Riešitelia:** I. Kundrata, K. Fröhlich, B. Hudec

**Partneri:** Univerzita Erlangen, Sempa Systems (Nemecko), Atlant 3D Nanosystems (Dánsko), Femtika (Litva)

**Projekt:** ATOPLOT – 3D ploter na báze nanášania po atómových vrstvách, uviesť zahraničného partnera alebo medzinárodný program (Horizon2020)

Cieľom projektu bolo uvedenie do praxe konceptu 3D plotera atómových vrstiev, čo je kombinácia technológií nanášania po atómových vrstvách (ALD) a 3D tlače. Túto technológiu rozvíja partner Atlant 3D Nanosystems, dánsky startup, ktorého zakladateľom a CTO je Ivan Kundrata, doktorand EIÚ SAV. Srdcom technológie je unikátna tryska, ktorá slúži ako mini priestorové ALD (spatial ALD) systém, pričom jej presným pohybom nad substrátom je možné kresliť vrstvy po atómových vrstvách, ako pri ALD. Technológia bola patentovaná, pričom EIÚ SAV bol jedným z troch držiteľov tohto patentu.

Úlohou EIÚ SAV v projekte Atoplot bol návrh, dizajn a charakterizácia tzv. demonštrátorov, teda jednoduchých mikroelektronických súčiastok na ktorých bolo možné demonštrovať schopnosti plottera. EIÚ SAV tieto súčiastky vyrobil konvenčnými metódami používanými v mikroelektronike (litografia, depozícia PVD a ALD, tvarovanie) a tieto boli potom porovnávané so súčiastkami priamo "vytlačenými" pomocou plottera. Jednalo sa o senzor teploty na báze tenkej vrstvy platiny, kapacitný senzor vzdialenosti na báze tenko-vrstvových kruhových platinových elektród a senzor tlaku na báze piezoelektrickej ALD ZnO vrstvy.

Publikácia:

KUNDRATA, Ivan - BARR, M.K.S. - TYMEK, S. - DÖHLER, D. - HUDEC, Boris - BRÜNER, P. - VANKO, Gabriel - PRECNER, Marián - YOKOSAWA, T. - SPIECKER, E. - PLAKHOTNYUK, M. - FRÖHLICH, Karol - BACHMANN, J. Additive manufacturing in atomic layer processing mode. In Small methods, 2022, no. 2101546. (2021: 15.367 - IF, Q1 - JCR, 3.668 - SJR, Q1 - SJR). ISSN 2366-9608. Dostupné na: <https://doi.org/10.1002/smtd.202101546> Typ: ADCA

**2.4. Publikačná činnosť** (zoznam je uvedený v prílohe C)

Tabuľka 2e Štatistika vybraných kategórií publikácií

| <b>PUBLIKAČNÁ A EDIČNÁ ČINNOSŤ</b>   | <b>Počet v r. 2022/<br/>doplňky z r. 2021</b> |
|--|---|
| <b>1. Vedecké monografie a monografické štúdie vydané v domácich vydavateľstvách (AAB, ABB)</b>  | <b>0 / 0</b>                                  |
| <b>2. Vedecké monografie a monografické štúdie vydané v zahraničných vydavateľstvách (AAA, ABA)</b>  | <b>0 / 0</b>                                  |
| <b>3. Odborné monografie, vysokoškolské učebnice a učebné texty vydané v domácich vydavateľstvách (BAB, ACB, CAB)</b>                          | <b>0 / 0</b>                                  |
| <b>4. Odborné monografie a vysokoškolské učebnice a učebné texty vydané v zahraničných vydavateľstvách (BAA, ACA, CAA)</b>                     | <b>0 / 0</b>                                  |
| <b>5. Kapitoly vo vedeckých monografiách vydaných v domácich vydavateľstvách (ABD)</b>   | <b>0 / 0</b>                                  |
| <b>6. Kapitoly vo vedeckých monografiách vydaných v zahraničných vydavateľstvách (ABC)</b>   | <b>0 / 0</b>                                  |
| <b>7. Kapitoly v odborných monografiách, vysokoškolských učebniciach a učebných textoch vydaných v domácich vydavateľstvách (BBB, ACD)</b>     | <b>0 / 0</b>                                  |
| <b>8. Kapitoly v odborných monografiách, vysokoškolských učebniciach a učebných textoch vydaných v zahraničných vydavateľstvách (BBA, ACC)</b> | <b>0 / 0</b>                                  |
| <b>9. Vedecké práce registrované v Current Contents Connect (ADCA, ADCB, ADDA, ADDB)</b>   | <b>48 / 0</b>                                 |
| <b>10. Vedecké práce registrované vo Web of Science Core Collection alebo Scopus (ADMA, ADMB, ADNA, ADN B)</b>                                 | <b>7 / 0</b>                                  |
| <b>11. Vedecké práce v ostatných domácich časopisoch (ADFA, ADFB)</b>  | <b>1 / 0</b>                                  |
| <b>12. Vedecké práce v ostatných zahraničných časopisoch (ADEA, ADEB)</b>  | <b>0 / 0</b>                                  |
| <b>13. Vedecké práce v domácich recenzovaných zborníkoch (AEDA)</b>  | <b>0 / 0</b>                                  |
| <b>14. Vedecké práce v zahraničných recenzovaných zborníkoch (AECA)</b>  | <b>0 / 0</b>                                  |
| <b>15. Publikované príspevky na domácich vedeckých konferenciách (AFB, AFD)</b>  | <b>24 / 0</b>                                 |
| <b>16. Publikované príspevky na zahraničných vedeckých konferenciách (AFA, AFC)</b>  | <b>0 / 0</b>                                  |
| <b>17. Vydané periodiká evidované v CCC, WoS Core Collection, SCOPUS</b>   | <b>1</b>                                      |
| <b>18. Ostatné vydané periodiká</b>  | <b>0</b>                                      |
| <b>19. Zostavovateľské práce knižného charakteru (FAI)</b>   | <b>0 / 0</b>                                  |
| <b>20. Preklady vedeckých a odborných textov (EAJ)</b>   | <b>0 / 0</b>                                  |
| <b>21. Heslá v odborných terminologických slovníkoch a encyklopédiách (BDA, BDB)</b>   | <b>0 / 0</b>                                  |
| <b>22. Recenzie v časopisoch a zborníkoch (EDI)</b>  | <b>0 / 0</b>                                  |

*Evidujú sa len tie práce zamestnancov a doktorandov, v ktorých je uvedená afiliácia k organizácii*

Tabuľka 2f Štatistika vedeckých prác podľa kvartilu vedeckého časopisu

| Kvartil vedeckého časopisu   | Q1     | Q2     | Q3     | Q4    | Spolu  |
|--|--------|--------|--------|-------|--------|
| <b>Podľa IF z r. 2021 (zdroj JCR)</b><br><i>Počet článkov / doplnky</i>      | 17 / 0 | 19 / 0 | 11 / 0 | 2 / 0 | 49 / 0 |
| <b>Podľa SJR z r. 2021 (zdroj Scimago)</b><br><i>Počet článkov / doplnky</i> | 28 / 0 | 20 / 0 | 3 / 0  | 4 / 0 | 55 / 0 |

Tabuľka 2g Ohlasy

| OHLASY   | Počet v r. 2021/<br>doplnky z r. 2020 |
|--|---------------------------------------|
| <b>Citácie vo WOS (1.1, 2.1)</b>   | 1571 / 38                             |
| <b>Citácie v SCOPUS (1.2, 2.2)</b>   | 115 / 0                               |
| <b>Citácie v iných citačných indexoch a databázach (9, 10, 3.2, 4.2)</b>             | 0 / 0                                 |
| <b>Citácie v publikáciách neregistrovaných v citačných indexoch (3, 4, 3.1, 4.1)</b> | 8 / 0                                 |
| <b>Recenzie na práce autorov z organizácie (5, 6, 7, 8)</b>                          | 0 / 0                                 |

## 2.5. Aktívna účasť na vedeckých podujatiach

Tabuľka 2h Vedecké podujatia

|  |    |
|--|----|
| <b>Prednášky a vývesky na medzinárodných vedeckých podujatiach</b> | 49 |
| <b>Prednášky a vývesky na národných vedeckých podujatiach</b>      | 44 |

## 2.6. Vyžiadané prednášky

*Ak boli príspevky publikované, sú súčasťou prílohy C, kategória (AFC, AFD, AFE, AFF, AFG, AFH)*

### 2.6.1. Vyžiadané prednášky na medzinárodných vedeckých podujatiach

1. **Feilhauer, J.**, Mruczkiewicz, M., Šoltýs, J., Zelent, M., Vetrova, Iu.V., Krylov, S., Tóbiš, J., Bublikov, K., Ščepka, T., Fedor, J., Dérier, J., and Cambel, V.: Noncollinear magnetic nanostructures as building blocks of topological magnonic crystals and magnetic force microscopy probes. In IEEE 12<sup>th</sup> Inter. Conf. Nanomater.: Applications & Properties. Krakow 2022.
2. **Gömöry, F.** and Solovyov, M.: Use of electromagnetic potentials for the modeling of critical state and AC losses in superconducting wires and cables. In: CIMTEC 2022 - 15<sup>th</sup> Inter. Conf. on Modern Mater. Technol. Perugia 2022.
3. **Gucmann, F.**, Hušeková, K., Dobročka, E., Nádaždy, P., Rosová, A., Egyenes, F., Hrubíšák, F., Keshtkar, J., Kubranská, A., and Ľapajna, M.: Ga<sub>2</sub>O<sub>3</sub> vs heat: anisotropy, thermal stability, and heat removal. In: E-MRS 2022 Fall meeting, Warsaw 2022.
4. **Skákalová, V.**: Toward exotic layered materials: 2d metal iodide. In 16<sup>th</sup> Inter. Conf. on Nanostruct. Mater. NANO 2022. Seville 2022.

## 2.6.2. Vyžiadané prednášky na národných vedeckých podujatiach

1. **Chromik, Š.**, Španková, M., Rosová, A., Dobročka, E., Gregor, M., Vojteková, T., Cordier, Y., Pécz, B., and Giannazzo, F.: Structural properties of MoS<sub>2</sub> and WS<sub>2</sub> two-dimensional systems prepared by PLD method on some specific substrates. In: 12<sup>th</sup> Inter. Conf. Solid State Surfaces Interfaces Conf. - SSSI 2022. Smolenice 2022.
2. **Gömöry, F.**: Silnoprúdové aplikácie supravodičov. In 1. letná škola fyziky kond. látok. Liptovský Ján 2022.
3. **Gucmann, F.**: Mať nanoprsty v materiálovej vede. In: Vedecký seminár víťazov súťaže mladých vedeckých pracovníkov SAV do 35 rokov. Košice 2022.
4. **Moško, M.**, Koscelanská, M., Plecenik, T., Volko, S., Gregor, M., Mošková, A., Vidiš, M., Durina, P., Roch, T., Grančič, B., Satrapinsky, L., Kúš, P., and Plecenik, A.: Point contact spectroscopy of superconductors using nanofilament in a titanium-oxide based memristor In: 12<sup>th</sup> Inter. Conf. Solid State Surfaces Interfaces Conf. - SSSI 2022. Smolenice 2022.
5. Pinčík, E., Kobayashi, H., Brunner, R., Mikula, M., **Kučera, M.**, Vojtek, P., Zábudlá, Z., Greguš, J., and Bačová, S.: Porous silicon and solar cell application. In: 12<sup>th</sup> Inter. Conf. Solid State Surfaces Interfaces Conf. - SSSI 2022. Smolenice 2022.
6. **Tóbiš, J.**: Umelé spinové kryštály, ich magnónové spektrum a možnosť manipulácie s ich základným stavom. In 26. konf. slov. fyzikov. Košice 2022.
7. Zehetner, J., **Vanko, G.**, Dohnal, F., **Izsák, T.**, Držík, M., and Kromka, A.: Recent challenges in micromachining of wide-bandgap materials and fabrication of MEMS for harsh environments. In 10<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. - ADEPT. Tatranská Lomnica 2022.

## 2.6.3. Vyžiadané prednášky na významných vedeckých inštitúciách

1. **Gucmann, F.**: Ga<sub>2</sub>O<sub>3</sub> vs heat: anisotropy, thermal stability, and heat removal. In Wuhan University, China 2022.
2. **Hutár, P.**, Hulman, M., Hofer, Ch., Kotrusz, P., and Skákalová, V.: Advances in graphene preparation through chemical routes: Characterization and application. In Norwegian Inst. for Air Research 2022.

## 2.7. Patentová a licenčná činnosť na Slovensku a v zahraničí v roku 2022

### 2.7.1. Vynálezy, na ktoré bol v roku 2022 udelený patent

#### a) na Slovensku

Názov vynálezu: Vertikálny GaN tranzistor s izolačným kanálom a spôsob jeho prípravy

Číslo patentu: SK289027

Dátum priority: 2017

Majiteľ / spolumajiteľ: Elektrotechnický ústav SAV

Pôvodcovia vynálezu: Kuzmík Ján

**b) v zahraničí**

**2.7.2. Vynálezy prihlásené v roku 2022**

**a) na Slovensku**

**b) v iných krajinách ako prioritná prihláška**

**c) PCT**

Názov vynálezu: Veľkoplošný detector jadrových častíc a žiarenia s podložkou, spôsob jeho výroby a zapojenie obsahujúce veľkoplošný detektor

Krajina: Slovensko

Číslo prihlášky: PCT/SK2022/050004

Dátum priority: 21.3.2022

Majiteľ / spolumajiteľ: Elektrotechnický ústav SAV

Pôvodcovia vynálezu: Zaťko Bohumír, Dubecký František

**d) EP**

**e) v iných krajinách v rámci tzv. národnej fázy po PCT, resp. po validácii EP**

**2.7.3. Úžitkové vzory na Slovensku**

**a) prihlásené v roku 2022**

**b) udelené v roku 2022**

Názov UV: Veľkoplošný detector jadrových častíc a žiarenia s podložkou, spôsob jeho výroby a zapojenie obsahujúce veľkoplošný detektor

Číslo UV: PUV50028-2021

Dátum udelenia: 19.2.2022

Majiteľ / spolumajiteľ UV: Elektrotechnický ústav SAV

Pôvodcovia UV: Zaťko Bohumír, Dubecký František

**2.7.4. Realizované vynálezy**

**a) predané patenty resp. prihlášky vynálezov (v prípade úplnej zmeny majiteľa patentu)**

**b) predané licencie (v prípade že majiteľom ostáva organizácia SAV)**

*Finančný prínos pre organizáciu SAV v roku 2022 a súčet za predošlé roky sa neuvádzajú, ak je zverejnenie v rozpore so zmluvou súvisiacou s realizáciou patentu.*

**2.8. Účasť expertov na hodnotení národných projektov (APVV, VEGA a iných)**

Tabuľka 2i Experti hodnotiaci národné projekty

| Meno pracovníka   | Typ programu/projektu/výzvy | Počet hodnotených projektov |
|-------------------|-----------------------------|-----------------------------|
| Hulman Martin     | SAS-HAS Mobility Project    | 1                           |
|                   | VEGA                        | 2                           |
| Chromik Štefan    | VEGA                        | 3                           |
| Rosová Alica      | APVV                        | 1                           |
| Sojková Michaela  | VEGA                        | 1                           |
| Španková Marianna | VEGA                        | 1                           |
| Vanko Gabriel     | VEGA                        | 1                           |

**2.9. Účasť na spracovaní hesiel do encyklopédie Beliana**

Počet autorov hesiel: 0

**2.10. Recenzovanie knižných publikácií a príspevkov vo vedeckých časopisoch**

Tabuľka 2j Počet vypracovaných recenzií na vedecké monografie, vedecké štúdie a zborníky

| Meno pracovníka   | Ved. monografie |             | Príspevky v časopisoch |              |         | Zborníky |             |
|-------------------|-----------------|-------------|------------------------|--------------|---------|----------|-------------|
|                   | Domáce          | Zahra-ničné | WoS, SCOPUS            | Iné databázy | Ostatné | Domáce   | Zahra-ničné |
| Gömöry Fedor      | 0               | 0           | 28                     | 0            | 0       | 0        | 0           |
| Gregušová Dagmar  | 0               | 0           | 10                     | 0            | 0       | 0        | 0           |
| Gucmann Filip     | 0               | 0           | 11                     | 0            | 0       | 0        | 0           |
| Hudec Boris       | 0               | 0           | 6                      | 0            | 0       | 0        | 0           |
| Hulman Martin     | 0               | 0           | 2                      | 0            | 0       | 0        | 0           |
| Chromik Štefan    | 0               | 0           | 2                      | 0            | 0       | 0        | 0           |
| Kováč Pavol       | 0               | 0           | 19                     | 0            | 0       | 0        | 0           |
| Kuzmík Ján        | 0               | 0           | 7                      | 0            | 0       | 0        | 0           |
| Mošat' Marek      | 0               | 0           | 3                      | 0            | 0       | 0        | 0           |
| Osvald Jozef      | 0               | 0           | 5                      | 0            | 0       | 0        | 0           |
| Pardo Enric       | 0               | 0           | 8                      | 0            | 0       | 0        | 0           |
| Rosová Alica      | 0               | 0           | 1                      | 0            | 0       | 0        | 0           |
| Skákalová Viera   | 0               | 0           | 4                      | 0            | 0       | 0        | 0           |
| Sojková Michaela  | 0               | 0           | 4                      | 0            | 0       | 0        | 0           |
| Soloviov Mykola   | 0               | 0           | 18                     | 0            | 0       | 0        | 0           |
| Španková Marianna | 0               | 0           | 2                      | 0            | 0       | 0        | 0           |
| Ťapajna Milan     | 0               | 0           | 33                     | 0            | 0       | 0        | 2           |
| Vanko Gabriel     | 0               | 0           | 1                      | 0            | 0       | 0        | 0           |



|               |          |          |            |          |          |          |          |
|---------------|----------|----------|------------|----------|----------|----------|----------|
| Varga Marian  | 0        | 0        | 3          | 0        | 0        | 0        | 0        |
| Zaťko Bohumír | 0        | 0        | 3          | 0        | 0        | 0        | 0        |
| <b>Spolu</b>  | <b>0</b> | <b>0</b> | <b>170</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>2</b> |

## 2.11. Iné informácie k vedeckej činnosti.

## 3. Doktorandské štúdium, iná pedagogická činnosť a budovanie ľudských zdrojov pre vedu a techniku

### 3.1. Údaje o doktorandskom štúdiu

Tabuľka 3a Počet doktorandov v roku 2022

| Forma                 | Počet k 31.12.2022 |   |                    |   | Počet doktorandov po doktorandskej skúške |   | Počet ukončených doktorantúr v r. 2022 |   |                     |   |                     |   |
|-----------------------|--------------------|---|--------------------|---|---|---|--|---|---------------------|---|---------------------|---|
|                       |                    |   |                    |   |   |   | Ukončenie z dôvodov                    |   |                     |   |                     |   |
|                       | celkový počet      |   | z toho novoprijatí |   |   |   | ukončenie úspešnou obhajobou           |   | predčasné ukončenie |   | neúspešné ukončenie |   |
| M                     | Ž                  | M | Ž                  | M | Ž   | M | Ž                                      | M | Ž                   | M | Ž                   |   |
| Denná zo zdrojov SAV  | 9                  | 3 | 3                  | 1 | 4   | 2 | 1                                      | 1 | 0                   | 0 | 0                   | 0 |
| Denná z iných zdrojov | 4                  | 1 | 0                  | 0 | 4   | 1 | 0                                      | 0 | 0                   | 0 | 0                   | 0 |
| Externá               | 1                  | 0 | 0                  | 0 | 1   | 2 | 0                                      | 0 | 0                   | 2 | 0                   | 0 |
| Spolu                 | 14                 | 4 | 3                  | 1 | 9   | 5 | 1                                      | 1 | 0                   | 2 | 0                   | 0 |
| Z toho zahraničných   | 5                  | 2 | 1                  | 1 | 2   | 1 | 0                                      | 0 | 0                   | 0 | 0                   | 0 |
| Súhrn                 | 18                 |   | 4                  |   | 14  |   | 2                                      |   | 2                   |   | 0                   |   |

Uvádzať len doktorandov organizácie ako externej vzdelávacej inštitúcie.

Riadok „Spolu“ je súčtom troch riadkov nad ním. Každá bunka v riadku „Súhrn“ vyjadruje celkový počet doktorandov (mužov a žien spolu), čiže je súčtom príslušných dvoch buniek z riadku „Spolu“. V stĺpci „Počet doktorandov po doktorandskej skúške“ sa uvádza počet doktorandov, ktorí počas roku 2022 boli aspoň 1 deň doktorandami po doktorandskej skúške. Sú číselne zahrnutí aj v predchádzajúcich stĺpcoch.

Pod predčasným ukončením rozumieme ukončenie bez obhajoby dizertačnej práce pričom doktorand neabsolvoval celú štandardnú dĺžku štúdia. Pod neúspešným ukončením rozumieme ukončenie bez úspešnej obhajoby dizertačnej práce, pričom študent absolvoval celú štandardnú dĺžku štúdia.

### 3.2. Zmena formy doktorandského štúdia

Tabuľka 3b Počty preradení z dennej formy na externú a z externej na dennú

| Pôvodná forma | Denná z prostriedkov SAV | Denná z prostriedkov SAV | Denná z iných zdrojov    | Denná z iných zdrojov | Externá                  | Externá               |
|---------------|--------------------------|--------------------------|--------------------------|-----------------------|--------------------------|-----------------------|
| Nová forma    | Denná z iných zdrojov    | Externá                  | Denná z prostriedkov SAV | Externá               | Denná z prostriedkov SAV | Denná z iných zdrojov |
| Počet         | 3                        | 0                        | 0                        | 0                     | 0                        | 0                     |

**3.3. Zoznam doktorandov, ktorí ukončili doktorandské štúdium úspešnou obhajobou**

Tabuľka 3c Menný zoznam ukončených doktorandov v roku 2022 úspešnou obhajobou

| Meno doktoranda          | Forma DŠ                                   | Mesiac, rok nástupu na DŠ | Mesiac, rok obhajoby | Číslo a názov študijného odboru              | Meno a organizácia školiteľa                                 | Fakulta udeľujúca vedeckú hodnotu           |
|--------------------------|--|---------------------------|----------------------|--|--|---|
| RNDr. Katarína Neilinger | interné štúdium hrazené z prostriedkov SAV | 9 / 2014                  | 8 / 2022             | 4.1.3 fyzika kondenzovaných látok a akustika | Ing. Ján Šoltýs PhD,<br>Elektrotechnický ústav SAV, v. v. i. | Fakulta matematiky, fyziky a informatiky UK |

**3.4. Zoznam doktorandov, ktorí ukončili doktorandské štúdium úspešnou obhajobou v nadštandardnej dĺžke štúdia**

Tabuľka 3d Menný zoznam ukončených doktorandov v roku 2022 úspešnou obhajobou v nadštandardnej dĺžke štúdia

| Meno doktoranda     | Forma DŠ                                   | Mesiac, rok nástupu na DŠ | Mesiac, rok obhajoby | Číslo a názov študijného odboru | Meno a organizácia školiteľa   | Fakulta udeľujúca vedeckú hodnotu         |
|---------------------|--|---------------------------|----------------------|---------------------------------|--|---|
| Ing. Marcel Talacko | interné štúdium hrazené z prostriedkov SAV | 9 / 2016                  | 8 / 2022             | 5.2.48 fyzikálne inžinierstvo   | RNDr. Marianna Španková PhD,<br>Elektrotechnický ústav SAV, v. v. i. | Fakulta elektrotechniky a informatiky STU |

**3.5. Uplatnenie absolventov doktorandského štúdia**

Tabuľka 3e Prehľad uplatnenia absolventov doktorandského štúdia

| Počet absolventov PhD. štúdia v roku 2022 (obhajoba leto 2022) | z toho koľkí sa zamestnali vo výskume (SAV, univerzity, rezortné výskumné ústavy) | z toho koľkí sa zamestnali v praxi mimo výskum, kde využívajú svoju kvalifikáciu | z toho koľkí sa zamestnali v praxi, kde nevyužívajú svoju kvalifikáciu | z toho koľkí boli nejaký čas nezamestnaní |
|--|---|--|--|---|
| 2  | 2   | 0  | 0  | 0   |

Zoznam interných a externých doktorandov je uvedený v prílohe A.

### 3.6. Medzinárodné doktorandské štúdium

Tabuľka 3f Počet študentov v medzinárodných programoch doktorandského štúdia

| Cotutelle | Co-direction | Iné | Zahraniční doktorandi štátne občianstvo/počet |
|-----------|--------------|-----|---|
| 0         | 0            | 0   | IRN/3, RUS/3, PAK/1                           |

*Zahraniční doktorandi sú doktorandi v dennej alebo externej forme štúdia, ktorí sú občanmi iných krajín.*

*Doktorandi školení v rámci Cotutelle alebo Co-direction sa do posledného stĺpca nezapočítavajú.*

### 3.7. Zoznam študijných odborov, na ktoré má ústav uzatvorenú rámcovú dohodu, s uvedením VŠ

Tabuľka 3g Zoznam študijných odborov, na ktoré má ústav uzatvorenú rámcovú dohodu, s uvedením univerzity/vysokej školy a fakulty, kde sa doktorandský študijný program uskutočňuje

| Názov študijného odboru (ŠO)           | Číslo ŠO | Názov doktorandského študijného programu | Doktorandské štúdium uskutočňované na (univerzita/vysoká škola a fakulta) |
|--|----------|--|---|
| fyzika                                 | 4.1.1    | Fyzika kondenzovaných látok a akustika   | Fakulta matematiky, fyziky a informatiky UK                               |
| fyzika kondenzovaných látok a akustika | 4.1.3    | Fyzika kondenzovaných látok a akustika   | Fakulta matematiky, fyziky a informatiky UK                               |
| elektronika                            | 5.2.13   | Elektronika a fotonika                   | Fakulta elektrotechniky a informatiky STU                                 |
| fyzikálne inžinierstvo                 | 5.2.48   | Fyzikálne inžinierstvo                   | Fakulta elektrotechniky a informatiky STU                                 |
| elektrotechnika                        | 5.2.9    | Fyzikálne inžinierstvo                   | Fakulta elektrotechniky a informatiky STU                                 |

*Názov a číslo študijného odboru vyplňte/vyberte podľa aktuálne platného zoznamu študijných odborov*

*<https://www.portalvs.sk/sk/studijne-odbory?from=menu1>. Názov doktorandského študijného programu v stĺpci 3 je potrebné vložiť ako voľný text.*

*Do 31. 8. 2023 študujú študenti doktorandského štúdia zaradení do študijných programov podľa zoznamu MŠVVaŠ, platného do 1. 9. 2019. Pre týchto študentov je potrebné napísať názov programu ako voľný text do stĺpca 3 a nevyplňovať stĺpce 1 a 2.*

Tabuľka 3h Účasť na pedagogickom procese

| Menný prehľad pracovníkov, ktorí boli menovaní do odborových komisií pre doktorandské štúdium | Menný prehľad pracovníkov, ktorí pôsobili ako členovia vedeckých rád univerzít, správnych rád univerzít a fakúlt | Menný prehľad pracovníkov, ktorí získali vyššiu vedeckú, pedagogickú hodnotu alebo vyšší kvalifikačný stupeň |
|---|--|--|
| RNDr. Vladimír Cambel, DrSc. (elektronika)  | doc. Ing. Fedor Gömöry, DrSc. (Elektrotechnická fakulta ŽU)  | RNDr. Katarína Neilinger, PhD. (IIB)   |
| doc. RNDr. Edmund Dobročka, CSc. (fyzikálne inžinierstvo)                                     | doc. Ing. Fedor Gömöry, DrSc. (Fakulta matematiky, fyziky a informatiky UK)                                      | Mgr. Enric Pardo, PhD. (I)   |
| doc. Ing. Fedor Gömöry, DrSc. (fyzikálne inžinierstvo)  | doc. Ing. Jozef Novák, DrSc. (Fakulta elektrotechniky a informatiky STU)   | Ing. Marcel Talacko, PhD. (IIB)  |
| RNDr. Dagmar Gregušová, DrSc. (elektrotechnika)   |  | RNDr. Katarína Neilinger, PhD. (PhD., Fakulta matematiky,  |

|   |  |   |
|---|--|---|
|   |  | fyziky a informatiky UK)  |
| RNDr. Dagmar Gregušová,<br>DrSc. (elektronika)                                |  | Ing. Marcel Talacko, PhD.<br>(PhD., Fakulta elektrotechniky a<br>informatiky STU) |
| Dr. rer. nat. Martin Hulman<br>(fyzika)                                       |  |   |
| Ing. Ján Kuzmík, DrSc.<br>(teoretická elektrotechnika)                        |  |   |
| Ing. Ján Kuzmík, DrSc.<br>(elektronika)                                       |  |   |
| doc. RNDr. Martin Moško,<br>DrSc. (fyzika kondenzovaných<br>látok a akustika) |  |   |
| doc. RNDr. Martin Moško,<br>DrSc. (chemická fyzika)                           |  |   |
| doc. RNDr. Martin Moško,<br>DrSc. (teoretická<br>elektrotechnika)             |  |   |
| doc. RNDr. Martin Moško,<br>DrSc. (fyzikálne inžinierstvo)                    |  |   |
| doc. Ing. Jozef Novák, DrSc.<br>(elektronika)                                 |  |   |
| RNDr. Marianna Španková,<br>PhD (elektrotechnika)                             |  |   |
| Ing. Milan Ťapajna, PhD.<br>(elektronika)                                     |  |   |
| Ing. Gabriel Vanko, PhD.<br>(elektronika)                                     |  |   |

### 3.8. Údaje o pedagogickej činnosti

Tabuľka 3i Prednášky a cvičenia vedené v roku 2022

| PEDAGOGICKÁ ČINNOSŤ                        | Prednášky |             | Cvičenia a semináre |             |
|--|-----------|-------------|---------------------|-------------|
|  | doma      | v zahraničí | doma                | v zahraničí |
| Počet prednášateľov alebo vedúcich cvičení | 2         | 0           | 6                   | 0           |
| Celkový počet hodín v r. 2022              | 8         | 0           | 40                  | 0           |

Prehľad prednášateľov predmetov a vedúcich cvičení, s uvedením názvu predmetu, úväzku, katedry, fakulty, univerzity/vysokej školy je uvedený v prílohe D.

Tabuľka 3j Aktivity pracovníkov na VŠ

|    |   |    |
|----|---|----|
| 1. | Počet pracovníkov, ktorí pôsobili ako vedúci alebo konzultanti diplomových a bakalárskych prác                                      | 9  |
| 2. | Počet vedených alebo konzultovaných diplomových a bakalárskych prác   | 9  |
| 3. | Počet pracovníkov, ktorí pôsobili ako školitelia doktorandov (PhD.)   | 15 |
| 4. | Počet školených doktorandov (aj pre iné inštitúcie)   | 19 |
| 5. | Počet oponovaných dizertačných a habilitačných prác   | 1  |
| 6. | Počet pracovníkov, ktorí oponovali dizertačné a habilitačné práce   | 1  |
| 7. | Počet pracovníkov, ktorí pôsobili ako členovia komisií pre obhajoby DrSc. prác  | 2  |
| 8. | Počet pracovníkov, ktorí pôsobili ako členovia komisií pre obhajoby PhD. prác   | 1  |
| 9. | Počet pracovníkov, ktorí pôsobili ako členovia komisií, resp. oponenti v inauguračnom alebo habilitačnom konaní na vysokých školách | 1  |

### 3.9. Iné dôležité informácie k pedagogickej činnosti

Ústav pozýva zahraničných odborníkov, aby predstavili výsledky v rôznych oblastiach výskumu. V tomto roku odznali prednášky:

- Dr. Chao Yuan (The Institute of Technological Sciences, Wuhan University, China): Pump-probe thermoreflectance techniques for non-contact and non-invasively characterizing the thermal properties of wide bandgap semiconductors
- prof. Pierra Ruterana, (Centre de Recherche sur les Ions, les Matériaux et la Photonique (CIMAP), Univ. Caen, Normandie): Dislocations and inversion domains in the wurtzite structure: a case study by HRTEM in GaN and ZnO
- Dr. Tetiany Kalmykovej (O.Ya. Usikov Institute for Radiophys. and Electron. (IRE) of NAS of Ukraine, Kharkov, v súčasnosti EIÚ SAV): Magnetoresonance Properties Of Complexly Structured Nanostructures
- Christoph Hofer (Univ. Antwerpen EMAT): Fast efficient imaging in scanning transmission electron microscopy via event driven ptychography
- F. Bondino (IOM-CNR, Laboratorio TASC, Trieste): BACH beamline: a multi-spectroscopy surface science approach for the investigation of advanced functional materials

- prof. Dr. Jani Kotakoski (Phys. Nanostructured Mater., Univ. Vienna): Atomic-scale tailoring of 2D materials
- Dr. Sarah M. Bayer-Skoff (Atominstitut, TU Wien): Enhancing light-matter interactions for quantum technologies

Ústav spolupracuje na výučbe predmetov Elektromagnetické prvky a systémy a Nanotechnológie na FEI STU a Praktikum Fyziky tuhých látok na FMFI UK.

Tradične Ústav zamestnáva VŠ študentov formou VPS. Ich práca často vyústi do prípravy semestrálnych, bakalárskych a diplomových prác. V r. 2022 ich bolo 8.

F. Gömory (Godár FEI STU)

Š. Chromik (Bennár diplomant FEI STU)

J. Šoltýs (Vajda diplomant FEI STU)

M. Sojková (V. Tašková diplomantka FEI STU)

Zápražný / Ferkodič (diplomant MTF STU)

R. Ries (Hlaváč bakalár FEI STU)

J. Šouc (Haško bakalár FEI STU)

A. Rosová (A. Kubranská diplomantka FEI STU)

B. Hudec (M. Horský, študent FEI STU)

## 4. Medzinárodná vedecká spolupráca

### 4.1. Medzinárodné vedecké podujatia

**4.1.1. Medzinárodné vedecké podujatia, ktoré organizácia SAV organizovala v roku 2022 alebo sa na ich organizácii podieľala, s vyhodnotením vedeckého a spoločenského prínosu podujatia**

**4.1.2. Medzinárodné vedecké podujatia, ktoré usporiada organizácia SAV v roku 2023 (anglický a slovenský názov podujatia, miesto a termín konania, meno, telefónne číslo a e-mail zodpovedného pracovníka)**

**4.1.3. Počet pracovníkov v programových a organizačných výboroch medzinárodných konferencií**

Tabuľka 4a Programové a organizačné výbory medzinárodných konferencií

| Meno pracovníka   | Programový | Organizačný | Programový i organizačný |
|-------------------|------------|-------------|--------------------------|
| Gömory Fedor      | 1          | 0           | 1                        |
| Španková Marianna | 1          | 0           | 0                        |
| <b>Spolu</b>      | 2          | 0           | 1                        |

### 4.2. Členstvo a funkcie v medzinárodných orgánoch

**4.2.1. Členstvo a funkcie v medzinárodných vedeckých spoločnostiach, úniách a národných komitétach SR**

doc. Ing. Fedor Gömory, DrSc.

Applied Superconductivity Educational Foundation (ASEF) (funkcia: člen výboru)  
European Society for Applied Superconductivity (funkcia: člen výboru)

Ing. Pavol Kováč, DrSc.

Academic Committee for International Congress on Advanced Materials (funkcia: člen)

#### 4.3. Účasť expertov na hodnotení medzinárodných projektov (EÚ RP, ESF a iných)

Tabuľka 4b Experti hodnotiaci medzinárodné projekty

| Meno pracovníka | Typ programu/projektu/výzvy                         | Počet hodnotených projektov |
|-----------------|---|-----------------------------|
| Gömöry Fedor    | Deutsche Forschungsgemeinschaft (DFG)<br>Nemecko    | 1                           |
|                 | Fund for Scientific Research, Belgicko              | 1                           |
|                 | Times Higher Education World University<br>Rankings | 1                           |
| Ťapajna Milan   | EIG Concert-Japan                                   | 4                           |

#### 4.4. Najvýznamnejšie prínosy MVTS ústavu vyplývajúce z mobility a riešenia medzinárodných projektov a iné informácie k medzinárodnej vedeckej spolupráci

*Prehľad údajov o medzinárodnej mobilite pracovníkov organizácie je uvedený v Prílohe E.*

*Prehľad a údaje o medzinárodných projektoch sú uvedené v kapitole 2 a Prílohe B.*

### 5. Koncepcia dlhodobého rozvoja organizácie

#### 5.1. Odporúčania z posledného pravidelného hodnotenia organizácií SAV (akreditácie)

Odporúčané nám boli aktivity, do ktorých sme aj tak chceli investovať

1. Venovať sa novým témam, potláčať menej úspešné
2. Investovať do obnovy prístrojov ústavu
3. Naďalej zlepšovať stratégiu v spolupráci s medzinárodným poradným zborom (IAB)
4. Investovať do obnovy vedcov, doktorandov, postdoktorandov
5. Investovať viac do transferu technológií (IPR, patentovanie, licencie, spin-off a pod.)

#### 5.2. Hlavné body Akčného plánu organizácie a stav ich plnenia

Náš ústav aj pomocou IAB kontroluje plnenie Strategického plánu vzhľadom na Organizačný poriadok EIÚ SAV, v.v.i.

#### 5.3. Aktualizácia Akčného plánu organizácie v roku 2022

Podľa odporúčaní IAB budeme aktualizovať Strategický plán na jar 2023.

## **6. Spolupráca s univerzitami/vysokými školami a inými subjektmi v oblasti vedy a techniky, okrem aktivít uvedených v kap. 2, 3, 4**

### **6.1. Spoločné pracoviská organizácie**

#### **6.1.1. Spolupráca s univerzitami/VŠ (fakultami)**

**Názov univerzity/vysokej školy a fakulty:** Fakulta elektrotechniky a informatiky STU

**Oblasť spolupráce:** Výchova študentov, spoločná príprava a riešenie projektov a aplikačných riešení

**Sídlo spoločného pracoviska (ak je vytvorené):**

**Začiatok spolupráce:** 1969

**Zhodnotenie:** Výsledkom spolupráce sú spoločné projekty, publikácie a PhD študenti.

**Názov univerzity/vysokej školy a fakulty:** Fakulta matematiky, fyziky a informatiky UK

**Oblasť spolupráce:** Výchova študentov, spoločná príprava a riešenie projektov a aplikačný ch riešení

**Sídlo spoločného pracoviska (ak je vytvorené):**

**Začiatok spolupráce:** 1992

**Zhodnotenie:** Výsledkom spolupráce sú spoločné projekty, publikácie a PhD študenti.

*Pozn.: uvádzajte len tie spolupráce, na ktoré má organizácia zmluvu resp. memorandum o zriadení spoločného pracoviska, resp. o vzájomnej spolupráci v konkrétnej oblasti výskumu*

#### **6.1.2. Spoločné pracoviská s inými organizáciami SAV**

*Pozn.: uvádzajte len tie spolupráce, na ktoré má organizácia zmluvu resp. memorandum o zriadení spoločného pracoviska, resp. o vzájomnej spolupráci v konkrétnej oblasti výskumu*

### **6.2. Spoločné pracoviská organizácie s inými inštitúciami mimo SAV a VŠ**

*Pozn.: uvádzajte len tie spolupráce, na ktoré má organizácia zmluvu resp. memorandum o zriadení spoločného pracoviska, resp. o vzájomnej spolupráci v konkrétnej oblasti výskumu*

### **6.3. Spoločné projekty s univerzitami a ostatnými inštitúciami mimo SAV**

**Názov projektu:** Dlhodosahový jav blízkosti v supravodič/feromagnet heteroštruktúrach

**Agentúra:** APVV

**číslo projektu:** 19-0303

**Spolupracujúce inštitúcie:** FMFI UK

**Koordinátor projektu:** FMFI UK

**Začiatok spolupráce:** 2020

**Koniec spolupráce:** 2023

**Zhodnotenie:**

**Názov projektu:** Metalické 2D dichalkogenidy prechodných kovov: príprava, štúdium vlastností a korelované stavy

**Agentúra:** APVV

**číslo projektu:** 19-0365

**Spolupracujúce inštitúcie:** FMFI UK

**Koordinátor projektu:** EIÚ SAV

**Začiatok spolupráce:** 2020



**Koniec spolupráce: 2023**

**Zhodnotenie:**

**Názov projektu:** Robustné spinové vlny pre budúce magnonické aplikácie

**Agentúra:** APVV

**číslo projektu:** 19-0311

**Spolupracujúce inštitúcie:** FMFI UK

**Koordinátor projektu:** EIÚ SAV

**Začiatok spolupráce:** 2020

**Koniec spolupráce:** 2023

**Zhodnotenie:**

**Názov projektu:** Optimalizácia okrúhleho kábla z vysokoteplotného supravodiča pre pulzné magnetické polia

**Agentúra:** APVV

**číslo projektu:** 20-0056

**Spolupracujúce inštitúcie:** Materiálovotechnologická fakulta STU

**Koordinátor projektu:** Materiálovotechnologická fakulta STU

**Začiatok spolupráce:** 2021

**Koniec spolupráce:** 2025

**Zhodnotenie:**

**Názov projektu:** Topologicky netriviálne magnetické a supravodivé nanoštruktúry

**Agentúra:** APVV

**číslo projektu:** 20-0425

**Spolupracujúce inštitúcie:** Prírodovedecká fakulta, UPJŠ

**Koordinátor projektu:** Prírodovedecká fakulta, UPJŠ

**Začiatok spolupráce:** 2021

**Koniec spolupráce:** 2024

**Zhodnotenie:**

**Názov projektu:** Nanoelsen – Nanoštrukturované tenkovrstvové materiály vyznačujúce sa slabými väzbovými interakciami pre elektronické a senzorické aplikácie

**Agentúra:** APVV

**číslo projektu:** 21-0278

**Spolupracujúce inštitúcie:** Ústav elektroniky a fotoniky FEI STU

**Koordinátor projektu:** Ústav elektroniky a fotoniky FEI STU

**Začiatok spolupráce:** 2022

**Koniec spolupráce:** 2026

**Zhodnotenie:**

**Názov projektu:** NanoMemb-RF – Moderné nanomembránové heteroštruktúry na báze GaAs pre vysoko produktívne vysokofrekvenčné prvky

**Agentúra:** APVV

**číslo projektu:** 21-0365

**Spolupracujúce inštitúcie:** Ústav elektroniky a fotoniky FEI STU

**Koordinátor projektu:** Ústav elektroniky a fotoniky FEI STU

**Začiatok spolupráce:** 2022

**Koniec spolupráce:** 2025

**Zhodnotenie:**

**Názov projektu:** PEGANEL – p-GaN elektronika pre úsporu energie a post-CMOS obvody

**Agentúra:** APVV

**číslo projektu:** 21-0008

**Spolupracujúce inštitúcie:** Ústav elektroniky a fotoniky FEI STU

**Koordinátor projektu:** EIÚ SAV

**Začiatok spolupráce:** 2022

**Koniec spolupráce:** 2025

**Zhodnotenie:**

**Názov projektu:** Fotonické laboratórium na čipe: výskum a vývoj platformy plazmonického senzora pre okamžitú detekciu zložiek v roztokoch

**Agentúra:** APVV

**číslo projektu:** 20-0437

**Spolupracujúce inštitúcie:** Ústav elektroniky a fotoniky FEI STU

**Koordinátor projektu:** Ústav elektroniky a fotoniky FEI STU

**Začiatok spolupráce:** 2021

**Koniec spolupráce:** 2024

**Zhodnotenie:**

**Názov projektu:** Transit2D – Tranzistory na báze 2D kovových chalkogenidov pripravených teplom podporovanou konverziou

**Agentúra:** APVV

**číslo projektu:** 21-0231

**Spolupracujúce inštitúcie:** Ústav elektroniky a fotoniky FEI STU

**Koordinátor projektu:** EIÚ SAV

**Začiatok spolupráce:** 2022

**Koniec spolupráce:** 2026

**Zhodnotenie:**

**Názov projektu:** Moderné elektronické súčiastky na báze ultraširokopásmového polovodiča Ga<sub>2</sub>O<sub>3</sub> pre budúce vysokonapäťové aplikácie

**Agentúra:** APVV

**číslo projektu:** 20-0220

**Spolupracujúce inštitúcie:** Ústav elektroniky a fotoniky FEI STU, Materiálovotechnologická fakulta STU

**Koordinátor projektu:** EIÚ SAV

**Začiatok spolupráce:** 2021

**Koniec spolupráce:** 2025

**Zhodnotenie:**

**Názov projektu:** Radiačne odolnejší senzor pre RTG zobrazovanie vyššej kvality

**Agentúra:** APVV

**číslo projektu:** 18-0273

**Spolupracujúce inštitúcie:** Ústav jadrového a fyzikálneho inžinierstva FEI STU

**Koordinátor projektu:** Ústav jadrového a fyzikálneho inžinierstva FEI STU

**Začiatok spolupráce:** 2019

**Koniec spolupráce:** 2023

**Zhodnotenie:**

**Názov projektu:** Výskum radiačne odolných polovodičových detektorov pre jadrovú energetiku

**Agentúra:** APVV

**číslo projektu:** 18-0243

**Spolupracujúce inštitúcie:** Ústav jadrového a fyzikálneho inžinierstva FEI STU

**Koordinátor projektu:** EIÚ SAV

**Začiatok spolupráce:** 2019

**Koniec spolupráce:** 2022

**Zhodnotenie:**

**Názov projektu:** Vysokoodolné polovodičové senzory ionizujúceho žiarenia pre využitie v radiačnom prostredí

**Agentúra:** VEGA

**číslo projektu:** 2/0084/20

**Spolupracujúce inštitúcie:** Ústav jadrového a fyzikálneho inžinierstva FEI STU

**Koordinátor projektu:** EIÚ SAV

**Začiatok spolupráce:** 2020

**Koniec spolupráce:** 2023

**Zhodnotenie:**

**Názov projektu:** Nanooptické sondy a senzory integrované na optickom vlákne

**Agentúra:** APVV

**číslo projektu:** 20-0264

**Spolupracujúce inštitúcie:** Žilinská univerzita v Žiline

**Koordinátor projektu:** Žilinská univerzita v Žiline

**Začiatok spolupráce:** 2021

**Koniec spolupráce:** 2024

**Zhodnotenie:**

*Pozn.: uviesť konkrétne spoločné aj bilaterálne projekty na základe platnej zmluvy o spolupráci*

#### **6.4. Iné typy spoločných aktivít s inštitúciami mimo SAV**

Príprava spoločného projektu IPCEI s firmou Bizzcom s.r.o.

### **7. Aplikácia výsledkov výskumu v spoločenskej a hospodárskej praxi**

#### **7.1. Výsledky výskumu organizácie aplikované v spoločenskej a hospodárskej praxi**

#### **7.2. Kontraktový – zmluvný výskum (vrátane zahraničných kontraktov)**

#### **7.3. Iné formy aplikácie výsledkov výskumu v spoločenskej a hospodárskej praxi**

### **8. Aktivity pre Národnú radu SR, vládu SR, ústredné orgány štátnej správy SR a iné organizácie**

#### **8.1. Členstvo v poradných zboroch vlády SR, Národnej rady SR, ministerstiev SR, orgánoch EÚ, EP, NATO a pod.**

Tabuľka 8a Členstvo v poradných zboroch Národnej rady SR, vlády SR, ministerstiev SR, orgánoch EÚ, EP, NATO a pod.

| <b>Meno pracovníka</b>       | <b>Názov orgánu</b>                    | <b>Funkcia</b>               |
|------------------------------|--|------------------------------|
| RNDr. Vladimír Cambel, DrSc. | Rozvoj spolupráce s Taiwanom           | Ministerstvo hospodárstva SR |
|                              | Práca na Koncepcii mikroelektroniky SR | Ministerstvo hospodárstva SR |

|                               |                                     |  |
|-------------------------------|-------------------------------------|--|
| doc. Ing. Fedor Gömöry, DrSc. | Akreditačná komisia                 | člen Pracovnej skupiny pre elektrotechniku |
|                               | SKVH                                | člen                                       |
| Ing. Pavol Kováč, DrSc.       | SKVH                                | člen                                       |
| Ing. Ján Kuzmík, DrSc.        | SKVH                                | člen                                       |
| Mgr. Bohumír Zaťko, PhD       | Komisia pre SUJV Dubna pri vláde SR | člen                                       |

**8.2. Expertízna činnosť a iné služby pre štátnu správu a samosprávy****8.3. Členstvo v radách štátnych programov a podprogramov ŠPVV a ŠO**

Tabuľka 8b Členstvo v radách štátnych programov a podprogramov ŠPVV a ŠO

| Meno pracovníka               | Názov orgánu                | Funkcia  |
|-------------------------------|-----------------------------|--|
| doc. Ing. Fedor Gömöry, DrSc. | Grantová agentúra MŠ - APVV | Člen Rady pre technické vedy   |
|                               | Grantová agentúra MŠ - APVV | Člen Rady pre periodické hodnotenie výskumnej, vývojovej, umeleckej a ďalšej tvorivej činnosti |
| Ing. Milan Ťapajna, PhD.      | Grantová agentúra MŠ - APVV | Člen Rady pre technické vedy   |

**8.4. Prehľad aktuálnych spoločenských problémov, ktoré riešilo pracovisko v spolupráci s Kanceláriou prezidenta SR, s vládnyimi a parlamentnými orgánmi alebo pre ich potrebu****9. Vedecko-organizačné a popularizačné aktivity****9.1. Vedecko-popularizačná činnosť**

Tabuľka 9a Súhrnné počty vedecko-popularizačných činností organizácie SAV

| Typ              | Počet | Typ                  | Počet | Typ                | Počet |
|------------------|-------|----------------------|-------|--------------------|-------|
| prednášky/besedy | 1     | tlač                 | 3     | TV                 | 1     |
| rozhlasy         | 0     | internet             | 2     | exkurzie           | 0     |
| publikácie       | 0     | multimediálne nosiče | 0     | dokumentárne filmy | 0     |
| iné              | 2     |                      |       |                    |       |

**9.2. Vedecko-organizačná činnosť**

Tabuľka 9b Vedecko-organizačná činnosť

| Názov podujatia | Domáca/<br>medzinárodná | Miesto | Dátum konania | Počet<br>účastníkov |
|-----------------|-------------------------|--------|---------------|---------------------|
|-----------------|-------------------------|--------|---------------|---------------------|

**9.3. Účasť na výstavách****9.4. Účasť v programových a organizačných výboroch národných konferencií**

Tabuľka 9c Programové a organizačné výbory národných konferencií

| Meno pracovníka | Programový | Organizačný | Programový i organizačný |
|-----------------|------------|-------------|--------------------------|
| Osvald Jozef    | 0          | 0           | 1                        |
| Vanko Gabriel   | 0          | 0           | 1                        |
| <b>Spolu</b>    | 0          | 0           | 2                        |

## 9.5. Členstvo v redakčných radách časopisov

doc. Ing. Fedor Gömöry, DrSc.

IEEE Transactions on Applied Superconductivity (funkcia: člen)

RNDr. Dagmar Gregušová, DrSc.

Electronic Materials - mdpi (funkcia: člen)

Ing. Filip Gucmann, PhD.

MDPI Materials, special issue Wide and Ultra-Wide Bandgap Semiconductor Materials for Power Devices (funkcia: guest editor)

Ing. Štefan Chromik, DrSc.

ICRN Condensed Matter Physics (funkcia: člen)

Ing. Pavol Kováč, DrSc.

Superconductor Science and Technology (funkcia: člen)

doc. Ing. Jozef Novák, DrSc.

Journal of Electrical Engineering (funkcia: člen)

Material Science in Semiconductor Processing (funkcia: člen)

Ing. Jozef Osvald, DrSc.

Materials Science in Semiconductor Processing (funkcia: člen)

Mgr. Enric Pardo, PhD.

Scientific Reports (funkcia: člen)

Superconductor Science and Technology (funkcia: člen)

Ing. Milan Ťapajna, PhD.

MDPI Materials, special issue Wide and Ultra-Wide Bandgap Semiconductor Materials for Power Devices (funkcia: guest editor)

Semiconductor Science and Technology (funkcia: člen)

Ing. Jaroslav Tóbk, PhD.

Scientific Reports (funkcia: člen)

## 9.6. Činnosť v domácich vedeckých spoločnostiach

## 9.7. Iné dôležité informácie o vedecko-organizačných a popularizačných aktivitách

Na slávnostnom bankete Elektrotechnického ústavu SAV, v. v. i., ktorý sa uskutočnil 24. mája 2022 v Kongresovom centre v Smoleniciach, vedenie a vedecká rada ústavu po druhý raz ocenila svojich významných pracovníkov udelením Medaily EIÚ SAV Ivana Hlásnika. Na slávnostnom podujatí sa okrem zamestnancov EIÚ SAV zúčastnili aj predseda SAV prof. RNDr. Pavol Šajgalík, DrSc., podpredseda SAV pre vedu, výskum a inovácie prof. RNDr. Peter Samuely, DrSc., a podpredseda SAV pre 1. oddelenie vied Mgr. Martin Venhart, PhD.

Medaila EIÚ SAV, ktorú sa ústav rozhodol udeľovať ako ocenenie svojim pracovníkom, ako aj vedcom mimo SAV, bola nazvaná podľa významnej osobnosti EIÚ SAV Ing. Ivana Hlásnika, DrSc., bývalého riaditeľa ústavu. Medaila sa udeľuje osobnostiam, ktoré sa výrazným spôsobom zaslúžili o rozvoj EIÚ SAV, zvýšenie kreditu ústavu v zahraničí, ako aj rozvoj vedy a výskumu na Slovensku i v zahraničí. Historicky prvá Medaila EIÚ SAV Ivana Hlásnika bola venovaná jeho pozostalej rodine. V tomto roku sa medaily odovzdávali po dlhšej prestávke spôsobenej covidom a ocenenia udelili vo viacerých kategóriách.

Za mimoriadny vedecký a organizačný prínos k rozvoju EIÚ SAV boli ocenení doc. Ing. Fedor Gömöry, DrSc., a Ing. Karol Fröhlich, DrSc. Cenu za celoživotné dielo, ktoré významne prispelo k rozvoju vedy a výskumu na Slovensku a v zahraničí, získali Ján Déer a Ľubomír Kopera. Prof. Goran Karapetrov z Drexel University vo Filadelfii, USA, získal vyznamenanie za mimoriadne zásluhy o rozvoj medzinárodnej spolupráce EIÚ SAV a za výsledky získané v rámci tejto spolupráce.

Na záver sa prítomným prihovril predseda SAV, ktorý vyzdvihol význam EIÚ SAV, v. v. i., a zablahoželal laureátom Medaily EIÚ SAV Ivana Hlásnika.

## 10. Činnosť knižnično-informačného pracoviska

### 10.1. Knižničný fond

Tabuľka 10a Knižničný fond

|                                       |   |      |
|---------------------------------------|---|------|
| <b>Knižničné jednotky spolu</b>       |   | 2183 |
| z toho                                | knihy a zviazané periodiká                            | 1217 |
|                                       | audiovizuálne dokumenty                               |      |
|                                       | elektronické dokumenty (vrátane digitálnych)          | 146  |
|                                       | mikroformy  |      |
|                                       | iné špeciálne dokumenty - dizertácie, výskumné správy | 819  |
|                                       | Rukopisy, vzácne tlače                                |      |
| Počet titulov dochádzajúcich periodík |   | 3    |
| z toho zahraničné periodiká           |   | 1    |
| Ročný prírastok knižničných jednotiek |   | 4    |
| v tom                                 | kúpou   | 1    |
|                                       | darom   | 3    |
|                                       | výmenou   |      |
|                                       | bezodplatným prevodom                                 |      |
|                                       | náhradou  |      |

|  |      |
|--|------|
| Úbytky knižničných jednotiek                 | 0    |
| Knižničné jednotky spracované automatizovane | 2183 |

Výraz „**v tom**“ označuje úplné (vyčerpávajúce) údaje, ktorých súčet sa musí rovnať údaju v riadku „spolu“, čiže nadradenému riadku.

Výraz „**z toho**“ označuje neúplné (výberové) údaje, ktorých súčet sa nemusí rovnať údaju v riadku „spolu“.

## 10.2. Výpožičky a služby

Tabuľka 10b Výpožičky a služby

| Výpožičky spolu (riadok 1)       |                                  |     |
|----------------------------------|----------------------------------|-----|
| v tom z<br>r. 1                  | prezenčné výpožičky              |     |
|                                  | absenčné výpožičky               |     |
| v tom z<br>r. 1                  | odborná literatúra pre dospelých |     |
|                                  | výpožičky periodík               |     |
| MVS iným knižniciam              |                                  |     |
| MVS z iných knižníc              |                                  |     |
| MMVS iným knižniciam             |                                  |     |
| MMVS z iných knižníc             |                                  |     |
| Počet vypracovaných bibliografií |                                  |     |
| Počet vypracovaných rešerší      |                                  | 254 |

## 10.3. Používatelia

Tabuľka 10c Používatelia

|  |     |
|--|-----|
| Registrovaní používatelia                              | 118 |
| Návštevníci knižnice spolu (bez návštevníkov podujatí) | 0   |

## 10.4. Iné údaje

Tabuľka 10d Iné údaje

|   |   |
|---|---|
| On-line katalóg knižnice na internete ( 1=áno, 0=nie) | 1 |
| Náklady na nákup knižničného fondu v €                |   |

## 10.5. Iné informácie o knižničnej činnosti

## 11. Aktivity v orgánoch SAV

### 11.1. Členstvo vo Výbore Snemu SAV

### 11.2. Členstvo v Predsedníctve SAV a vo Vedeckej rade SAV

### 11.3. Členstvo v komisiách SAV

RNDr. Vladimír Cambel, DrSc.

- Etická komisia SAV (člen)

Ing. Ján Fedor, PhD

- Kontrolná rada areálu SAV (člen)

doc. Ing. Fedor Gömöry, DrSc.

- Akreditačná komisia SAV (člen )
- Komisia pre stratégiu rozvoja SAV (člen)
- Porota pre udeľovanie Medzinárodnej ceny SAV (člen)
- Rada SAV pre vzdelávanie a doktorandské štúdium (člen)

RNDr. Dagmar Gregušová, DrSc.

- Komisia pre posudzovanie vedeckej kvalifikácie (predsedníčka)

### 11.4. Členstvo v orgánoch VEGA

RNDr. Dagmar Gregušová, DrSc.

- Komisia 5 pre elektrotechniku, automatizáciu a riadiace systémy a príbuzné odbory informačných a komunikačných technológií (podpredsedníčka)
- Rozšírené Predsedníctvo VEGA (člen)

Dr. rer. nat. Martin Hulman

- Komisia VEGA č.1 pre matematické vedy, počítačové a informatické vedy fyzikálne vedy (člen )

Ing. Ján Kuzmík, DrSc.

- Komisia 5 pre elektrotechniku, automatizáciu a riadiace systémy a príbuzné odbory informačných a komunikačných technológií (člen)

Ing. Alica Rosová, CSc.

- Komisia pre strojárstvo a príbuzné odbory informačných a komunikačných technológií a materiálové inžinierstvo (člen)

Ing. Milan Ťapajna, PhD.

- Komisia pre elektrotechniku, automatizáciu a riadiace systémy a príbuzné odbory informačných a komunikačných technológií (člen)

Mgr. Bohumír Zat'ko, PhD

- Komisia č. 5 pre elektrotechniku, automatizáciu a riadiace systémy a príbuzné odbory informačných a komunikačných technológií (člen)



## 12. Hospodárenie organizácie

### 12.1. Výdavky organizácie

Tabuľka 12a Výdavky organizácie (skutočnosť k 31. 12. 2022 v €)

| Typ organizácie (v. v. i.)                 |              | Zdroje, z ktorých sa kryli jednotlivé výdavky |                             |                |                         |
|--|--------------|---|-----------------------------|----------------|-------------------------|
| Výdavky                                    | Spolu        | kapitola SAV (111)                            | iné štátne a verejné zdroje | ostatné zdroje | % krytia z kapitoly SAV |
| <b>1. Bežné výdavky</b>                    | 4 054 736,70 | 2 438 538,30                                  | 1 346 007,39                | 270 191,01     | 60,14                   |
| z toho: mzdy (610)                         | 1 948 937,12 | 1 511 886,00                                  | 337 537,19                  | 99 513,93      | 77,57                   |
| vedecká výchova<br>štipendiá (640)         | 127 481,60   | 118 942,25                                    | 300,00                      | 8 239,35       | 93,30                   |
| poistné a príspevok do<br>poisťovní (620)  | 672 485,31   | 514 595,67                                    | 118 805,99                  | 39 083,65      | 76,52                   |
| tovary a služby (630)                      | 696 407,23   | 267 914,38                                    | 330 021,42                  | 98 471,43      | 38,47                   |
| transfery partnerom<br>projektov (640)     | 609 425,44   | 25 200,00                                     | 559 342,79                  | 24 882,65      | 4,14                    |
| <b>2. Kapitálové výdavky</b>               | 73 832,51    | 19 892,51                                     |                             | 53 940,00      | 26,94                   |
| z toho: obstarávanie<br>kapitálových aktív | 73 832,51    | 19 892,51                                     |                             | 53 940,00      | 26,94                   |
| kapitálové transfery                       | 0,00         | 0,00  | 0,00                        | 0,00           | 0,00                    |

**12.2. Zdroje financovania organizácie**

Tabuľka 12b Zdroje financovania organizácie (skutočnosť k 31. 12. 2022 v €)

| <b>Typ organizácie (v. v. i.)</b>             |              | <b>Z toho kategórie</b>  |                             |  |  |
|---|--------------|--------------------------|-----------------------------|--|--|
| <b>Zdroje</b>                                 | <b>Spolu</b> | <b>Kapitálové zdroje</b> | <b>zdroje na mzdy (610)</b> | <b>zdroje na odvody do poisťovní (620)</b> | <b>zdroje na transfery partnerom projektov</b> |
| <b>1. kapitola SAV (111)</b>                  | 2 438 538,30 | 30 530,00                | 1 511 886,00                | 514 595,67                                 | 0,00   |
| z toho: VEGA                                  | 126 750,00   | 23 430,00                |                             |  | 0,00   |
| MVTS výskumné projekty                        | 50 479,00    | 7 100,00                 |                             |  | 0,00   |
| MVTS podpora                                  | 9 000,00     |                          |                             |  | 0,00   |
| SASPRO/MOREPRO                                | 12 000,00    |                          |                             |  | 0,00   |
| Vydávanie časopisov                           | 0,00         |                          |                             |  | 0,00   |
| Vedecká výchova (štipendiá)                   | 125 214,25   |                          |                             |  | 0,00   |
| OTAS (630)                                    | 88 613,38    |                          |                             |  | 0,00   |
| <b>2. ŠF EÚ vr. fin. zo ŠR</b>                | 636 698,01   |                          | 74 453,39                   | 26 306,09                                  | 398 388,50                                     |
| <b>3. medzinárodné grantové projekty</b>      | 259 660,45   |                          | 63 345,29                   | 22 843,99                                  | 0,00   |
| z toho: H2020                                 | 259 660,45   |                          | 63 345,29                   | 22 843,99                                  | 0,00   |
| <b>4. iné štátne a verejné zdroje (spolu)</b> | 822 963,00   |                          | 262 783,80                  | 92 499,90                                  | 142 845,00                                     |
| z toho: APVV                                  | 720 091,00   |                          | 209 308,80                  | 73 676,70                                  | 142 845,00                                     |
| podpora z kapitoly MŠVVaŠ SR (stimuly)        | 102 872,00   |                          | 53 475,00                   | 18 823,20                                  | 0,00   |
| <b>5. ostatné zdroje</b>                      | 121 757,53   |                          |                             |  | 0,00   |
| z toho: príjmy z prenájmu                     | 0,00         |                          |                             |  | 0,00   |
| príjmy z podnikateľskej činnosti              | 0,00         |                          |                             |  | 0,00   |
| príjmy z expertnej činnosti a služieb         | 121 757,53   |                          |                             |  | 0,00   |

### 13. Nadácie a fondy pri organizácii SAV

### 14. Informácie o aktivitách súvisiacich s uplatňovaním princípov rodovej rovnosti

#### 14.1. Stručné hodnotenie stavu uplatňovania princípov rodovej rovnosti v organizácii, súvisiace aktivity a opatrenia, návrhy na aktualizáciu Plánu rodovej rovnosti SAV

V EIÚ SAV, v.v.i. sú princípy rodovej rovnosti (RR) dôsledne dodržiavané, náš ústav bol v tomto zmysle označený hlavným riešiteľom projektu Athena (G. Bianchim) ako „ostrov pozitívnej deviácie v rámci SAV“. Je to najmä kvôli ústretovosti voči pracovníckam na a po materskej/rodičovskej dovolenke a vďaka Komisii pre rodovú rovnosť a etické problémy, ktorá má na ústave dohľad nad dodržiavaním princípov RR.

O našich skúsenostiach s dodržiavaním RR sme podali informácie na dvoch podujatiach. Prvou bola Akadémia 21.storočia – cestou inklúzií vo výskume a inováciách (CVTI, 3.október 2021), na ktorej prezentovala Mgr. Miroslava Blázyová príspevok „Rodová rovnosť na Elektrotechnickom ústave SAV, v.v.i.“.

Druhým podujatím bol seminár usporiadaný riešiteľmi projektu Athena, kde riaditeľ ústavu V. Cambel podal pre riaditeľov ostatných ústavov informáciu na rovnakú tému „Rodová rovnosť na Elektrotechnickom ústave SAV, v.v.i.“.

#### 14.2. Rodová skladba hlavných riešiteľov (vedúcich) projektov

Tabuľka 14a Rodová skladba hlavných riešiteľov domácich projektov

| ŠTRUKTÚRA PROJEKTOV  | Organizácia SAV je nositeľom projektu |                 |      | Organizácia SAV je zmluvným partnerom |                                |      |
|--|---------------------------------------|-----------------|------|---------------------------------------|--------------------------------|------|
|  | Počet                                 | Hlavný riešiteľ |      | Počet                                 | Hlavný riešiteľ za organizáciu |      |
|  |                                       | Muž             | Žena |                                       | Muž                            | Žena |
| <b>1. Projekty VEGA</b>  | 13                                    | 10              | 3    | 1                                     | 1                              | 0    |
| <b>2. Projekty APVV</b>  | 14                                    | 14              | 0    | 11                                    | 9                              | 2    |
| <b>3. Projekty EŠIF/OP ŠF</b>  | 1                                     | 1               | 0    | 1                                     | 1                              | 0    |
| <b>4. Projekty SASPRO, MoRePro, IMPULZ</b>   | 1                                     | 1               | 0    | 0                                     | 0                              | 0    |
| <b>5. Iné projekty (FM EHP, Vedecko-technické projekty, na objednávku rezortov a pod.)</b> | 2                                     | 0               | 2    | 0                                     | 0                              | 0    |

Tabuľka 14b Rodová skladba hlavných riešiteľov medzinárodných projektov

| ŠTRUKTÚRA PROJEKTOV  | Organizácia SAV je nositeľom projektu |                 |      | Organizácia SAV je zmluvným partnerom |                                |      |
|--|---------------------------------------|-----------------|------|---------------------------------------|--------------------------------|------|
|  | Počet                                 | Hlavný riešiteľ |      | Počet                                 | Hlavný riešiteľ za organizáciu |      |
|  |                                       | Muž             | Žena |                                       | Muž                            | Žena |
| <b>1. Projekty Horizont 2020 a Horizont Európa</b>                   | 0                                     | 0               | 0    | 6                                     | 6                              | 0    |
| <b>2. Projekty ERA.NET, ESA, JRP</b>                                 | 0                                     | 0               | 0    | 1                                     | 1                              | 0    |
| <b>3. Projekty COST</b>  | 0                                     | 0               | 0    | 3                                     | 3                              | 0    |
| <b>4. Projekty EUREKA, NATO, UNESCO, CERN, IAEA, IVF, ERDF a iné</b> | 0                                     | 0               | 0    | 3                                     | 2                              | 1    |
| <b>5. Projekty v rámci medzivládnych dohôd</b>                       | 0                                     | 0               | 0    | 0                                     | 0                              | 0    |
| <b>6. Bilaterálne projekty MAD, Mobility, Open Mobility</b>          | 0                                     | 0               | 0    | 0                                     | 0                              | 0    |
| <b>7. Bilaterálne projekty ostatné</b>                               | 5                                     | 3               | 2    | 0                                     | 0                              | 0    |
| <b>8. Podpora MVTS z národných zdrojov okrem SAV (APVV a iné)</b>    | 0                                     | 0               | 0    | 0                                     | 0                              | 0    |
| <b>9. SAS-UPJŠ ERC Visiting Fellowship Grants</b>                    | 0                                     | 0               | 0    | 0                                     | 0                              | 0    |
| <b>10. Iné projekty</b>  | 0                                     | 0               | 0    | 0                                     | 0                              | 0    |

### 14.3. Výskum zameraný na rodovú problematiku

*Uveďte stručné, základné informácie o projektoch orientovaných na rodovú problematiku, ak organizácia takýto výskum realizuje. Informácie o financovaní a výsledkoch takýchto projektov sa nachádzajú v kapitole 2 a v prílohe C.*

### 15. Iné významné činnosti organizácie SAV

## **16. Vyznamenania, ocenenia a ceny udelené pracovníkom organizácie v roku 2022**

### **16.1. Domáce ocenenia**

#### **16.1.1. Ocenenia SAV**

**Búran Marek**

Súťaž doktorandov a mladých vedeckých pracovníkov do 35 rokov

*Oceňovateľ: SAV*

*Opis: 2. miesto*

**Gömöry Fedor**

Zlatá medaila SAV

*Oceňovateľ: SAV*

**Gucmann Filip**

Ocenenie špičkových publikácií SAV

*Oceňovateľ: SAV*

*Opis: V kategórii Špičkové časopisecké publikácie*

**Gucmann Filip**

Súťaž doktorandov a mladých vedeckých pracovníkov do 35 rokov

*Oceňovateľ: SAV*

*Opis: 2. miesto*

**Mruczkiewicz Michal**

Špičková publikácia SAV

*Oceňovateľ: SAV*

*Opis: kategória Nature Index*

**Sojková Michaela**

Špičková publikácia SAV

*Oceňovateľ: SAV*

*Opis: kategória Nature Index*

**Vetrova Iuliia**

Špičková publikácia SAV

*Oceňovateľ: SAV*

*Opis: kategória Nature Index*

#### **16.1.2. Iné domáce ocenenia**

**Búran Marek**

Študentská osobnosť Slovenska akad. r. 2021/2022

*Oceňovateľ: Junior Chamber International-Slovakia*

*Opis: 1. miesto v kategórii Elektrotechnika, priemyselné technológie za mimoriadne výsledky v študijnej ako aj vedecko-výskumnej oblasti*

**Hrdá Jana**

Študent roka 2022

Oceňovateľ: *Rektor STU*

## **16.2. Medzinárodné ocenenia**

**Varga Marian**

The Best Poster Contest NANOCON 2022

Oceňovateľ: *TANGER Ltd.*

Opis: <https://www.nanocon.eu/en/contests/>

## **17. Poskytovanie informácií v súlade so zákonom č. 211/2000 Z. z. o slobodnom prístupe k informáciám v znení neskorších predpisov (Zákon o slobode informácií)**

## **18. Problémy a podnety pre činnosť SAV**

### **Správu o činnosti organizácie SAV spracoval(i):**

RNDr. Vladimír Cambel, DrSc., 02/ 5922 2552, 2555

Ing. Jozef Fabian, CSc, 02/ 5922 2658

PhDr. Anna Gömöryová, 0903 919 384

Schválila vedecká rada organizácie SAV dňa 17. 1. 2023

**Riaditeľ organizácie SAV**

**Predseda vedeckej rady**



.....  
RNDr. Vladimír Cambel, DrSc.

.....  
RNDr. Dagmar Gregušová, DrSc.

## Prílohy

### Príloha A

#### Zoznam zamestnancov a doktorandov organizácie k 31.12.2022

##### Zoznam zamestnancov podľa štruktúry

|  | Meno s titulmi                   | Úväzok<br>(v %) | Ročný prepočítaný<br>úväzok |
|--|----------------------------------|-----------------|-----------------------------|
| <b>Vedúci vedeckí pracovníci DrSc.</b> |                                  |                 |                             |
| 1.                                     | RNDr. Vladimír Cambel, DrSc.     | 100             | 1.00                        |
| 2.                                     | doc. Ing. Fedor Gömöry, DrSc.    | 100             | 1.00                        |
| 3.                                     | RNDr. Dagmar Gregušová, DrSc.    | 100             | 1.00                        |
| 4.                                     | Ing. Štefan Chromík, DrSc.       | 40              | 0.40                        |
| 5.                                     | Ing. Pavol Kováč, DrSc.          | 100             | 1.00                        |
| 6.                                     | Ing. Ján Kuzmík, DrSc.           | 100             | 1.00                        |
| 7.                                     | doc. RNDr. Martin Moško, DrSc.   | 40              | 0.18                        |
| 8.                                     | doc. Ing. Jozef Novák, DrSc.     | 60              | 0.60                        |
| 9.                                     | Ing. Jozef Osvald, DrSc.         | 40              | 0.40                        |
| 10.                                    | doc. Ing. Viera Skákalová, DrSc. | 60              | 0.60                        |
| <b>Samostatní vedeckí pracovníci</b>   |                                  |                 |                             |
| 1.                                     | Ing. Michal Blaho, PhD.          | 100             | 1.00                        |
| 2.                                     | RNDr. Pavol Boháček, CSc.        | 40              | 0.40                        |
| 3.                                     | doc. RNDr. Edmund Dobročka, CSc. | 80              | 0.80                        |
| 4.                                     | Ing. Ján Fedor, PhD              | 100             | 1.00                        |
| 5.                                     | Mgr. Juraj Feilhauer, PhD.       | 100             | 1.00                        |
| 6.                                     | Ing. Filip Gucmann, PhD.         | 100             | 1.00                        |
| 7.                                     | RNDr. Štefan Haščík, PhD.        | 60              | 0.60                        |
| 8.                                     | Ing. Boris Hudec, PhD.           | 100             | 1.00                        |
| 9.                                     | Dr. rer. nat. Martin Hulman      | 100             | 1.00                        |
| 10.                                    | Ing. Tibor Izsák, PhD.           | 100             | 1.00                        |
| 11.                                    | RNDr. Dušan Korytár, CSc.        | 25              | 0.25                        |
| 12.                                    | Mgr. Peter Kotrusz, PhD.         | 100             | 0.40                        |
| 13.                                    | Mgr. Ján Kováč, PhD.             | 100             | 1.00                        |
| 14.                                    | RNDr. Michal Kučera, PhD         | 50              | 0.50                        |
| 15.                                    | Ing. Róbert Kúdela, CSc.         | 40              | 0.40                        |
| 16.                                    | Mgr. Agáta Laurenčíková, PhD.    | 100             | 0.50                        |
| 17.                                    | Ing. Peter Lobotka, CSc.         | 20              | 0.20                        |

|                           |                                    |     |      |
|---------------------------|------------------------------------|-----|------|
| 18.                       | RNDr. Antónia Mošková, CSc.        | 100 | 1.00 |
| 19.                       | Dr. Michal Mruczkiewicz            | 25  | 0.38 |
| 20.                       | Mgr. Enric Pardo, PhD.             | 100 | 1.00 |
| 21.                       | Ing. Marián Precner, PhD.          | 100 | 1.00 |
| 22.                       | Ing. Alica Rosová, CSc.            | 100 | 1.00 |
| 23.                       | Mgr. Eugen Seiler, PhD             | 100 | 1.00 |
| 24.                       | Mgr. Michaela Sojková, PhD.        | 100 | 1.00 |
| 25.                       | Mgr. Mykola Soloviov, PhD.         | 100 | 1.00 |
| 26.                       | Ing. Roman Stoklas, PhD.           | 100 | 1.00 |
| 27.                       | Ing. Ján Šoltýs, PhD               | 100 | 1.00 |
| 28.                       | Ing. Ján Šouc, CSc.                | 80  | 0.80 |
| 29.                       | RNDr. Marianna Španková, PhD       | 100 | 1.00 |
| 30.                       | Ing. Milan Ťapajna, PhD.           | 75  | 0.75 |
| 31.                       | Ing. Jaroslav Tóvik, PhD.          | 80  | 0.80 |
| 32.                       | Ing. Gabriel Vanko, PhD.           | 100 | 1.00 |
| 33.                       | Ing. Marian Varga, PhD.            | 100 | 1.00 |
| 34.                       | Ing. Zdenko Zápražný, PhD.         | 100 | 1.00 |
| 35.                       | Mgr. Bohumír Zaťko, PhD            | 100 | 1.00 |
| <b>Vedeckí pracovníci</b> |                                    |     |      |
| 1.                        | Mgr. Konstantin Bublikov, PhD.     | 100 | 0.53 |
| 2.                        | MSc. Anang Dadhich, PhD.           | 100 | 1.00 |
| 3.                        | Ing. Jozef Fabian, CSc             | 100 | 1.00 |
| 4.                        | Ing. Norbert Gál, PhD.             | 100 | 0.83 |
| 5.                        | Ing. Ladislav Hrubčín, CSc.        | 20  | 0.15 |
| 6.                        | Mgr. Peter Hutár, PhD.             | 100 | 1.00 |
| 7.                        | RNDr. Tetiana Kalmykova, PhD.      | 100 | 0.75 |
| 8.                        | Ing. Tomáš Kujovič, PhD.           | 100 | 1.00 |
| 9.                        | Ing. Marek Mošat', PhD.            | 100 | 1.00 |
| 10.                       | Mgr. Peter Nádaždy, PhD.           | 50  | 0.50 |
| 11.                       | RNDr. Katarína Neilinger, PhD.     | 80  | 0.67 |
| 12.                       | RNDr. Lenka Pribusová Slušná, PhD. | 100 | 1.00 |
| 13.                       | Ing. Rastislav Ries, PhD.          | 100 | 1.00 |
| 14.                       | Dr. Arpit Kumar Srivastava         | 100 | 1.00 |
| 15.                       | Ing. Tomáš Ščepka, PhD.            | 100 | 1.00 |
| 16.                       | Ing. Marcel Talacko, PhD.          | 100 | 0.67 |



| <b>Odborní pracovníci s VŠ vzdelaním (výskumní a vývojoví zamestnanci)</b> |                                |     |      |
|--|--------------------------------|-----|------|
| 1.   | Ing. Michal Bennár             | 10  | 0.03 |
| 2.   | Ing. Dušan Berek               | 100 | 1.00 |
| 3.   | Ing. Marek Búran               | 100 | 0.40 |
| 4.   | Mgr. Fridrich Egyenes          | 100 | 0.40 |
| 5.   | Ing. Peter Eliáš               | 100 | 1.00 |
| 6.   | MSc. Ghazaleh Esmaeili Dehaghi | 10  | 0.28 |
| 7.   | Ing. Lubomír Frolek            | 100 | 1.00 |
| 8.   | Ing. Stanislav Hasenöhr        | 100 | 1.00 |
| 9.   | Mgr. Jana Hrdá                 | 10  | 0.10 |
| 10.  | Ing. Fedor Hrubíšák            | 10  | 0.10 |
| 11.  | MSc. Arif Hussain              | 10  | 0.10 |
| 12.  | Ing. Imrich Hušek              | 100 | 1.00 |
| 13.  | RNDr. Kristína Hušeková        | 100 | 1.00 |
| 14.  | MSc. Javad Keshtar             | 10  | 0.10 |
| 15.  | Ing. Eva Kováčová              | 100 | 1.00 |
| 16.  | Sergei Krylov                  | 10  | 0.10 |
| 17.  | Ing. Martin Kucharovič         | 10  | 0.10 |
| 18.  | Ing. Tibor Melíšek             | 60  | 0.63 |
| 19.  | MSc. Saviz Parsa Saeb          | 10  | 0.10 |
| 20.  | Mgr. Michal Pecz               | 10  | 0.37 |
| 21.  | Ing. Ondrej Pohorelec          | 100 | 1.00 |
| 22.  | Mgr. Mária Sekáčová            | 60  | 0.60 |
| 23.  | Mgr. Peter Šichman             | 100 | 1.00 |
| 24.  | Mgr. Iuliia Vetrova            | 100 | 0.60 |
| 25.  | Mgr. Tatiana Vojteková         | 10  | 0.10 |
| <b>Odborní pracovníci s VŠ vzdelaním (ostatní zamestnanci)</b>             |                                |     |      |
| 1.   | Mgr. Miroslava Blázyová        | 100 | 1.00 |
| 2.   | PhDr. Anna Gömöryová           | 100 | 1.00 |
| 3.   | Ing. Pavol Mozola              | 100 | 1.00 |
| 4.   | Mgr. Vojtech Ogrodnik          | 40  | 0.40 |
| 5.   | Ing. Marta Zofcsáková          | 100 | 1.00 |
| 6.   | Mgr. Eva Žiačiková             | 100 | 0.75 |
| <b>Odborní pracovníci ÚSV</b>  |                                |     |      |
| 1.   | Juraj Arbet                    | 100 | 1.00 |

|                           |                       |     |      |
|---------------------------|-----------------------|-----|------|
| 2.                        | Ján Dérer             | 60  | 0.60 |
| 3.                        | Michal Gerboc         | 100 | 1.00 |
| 4.                        | Iveta Grófova         | 100 | 1.00 |
| 5.                        | Martin Grujbár        | 100 | 1.00 |
| 6.                        | Ľubomír Kopera        | 100 | 1.00 |
| 7.                        | Magdaléna Krajčírová  | 100 | 1.00 |
| 8.                        | Peter Martiš          | 100 | 1.00 |
| 9.                        | Darina Ružičková      | 100 | 0.08 |
| 10.                       | Jana Ryzá             | 100 | 1.00 |
| 11.                       | Alena Seifertová      | 100 | 1.00 |
| 12.                       | Edita Sýkorová        | 50  | 0.50 |
| 13.                       | Edita Šimeková        | 100 | 1.00 |
| 14.                       | Stanislav Štefánik    | 100 | 1.00 |
| 15.                       | Juraj Tančár          | 50  | 0.50 |
| 16.                       | Iveta Tóthová         | 100 | 1.00 |
| <b>Ostatní pracovníci</b> |                       |     |      |
| 1.                        | Jolana Častková       | 100 | 1.00 |
| 2.                        | Kvetoslava Hamburgová | 100 | 1.00 |
| 3.                        | Iveta Putiková        | 100 | 1.00 |
| 4.                        | Ivo Šimek             | 50  | 0.55 |
| 5.                        | Róbert Vanek          | 100 | 1.00 |

**Zoznam zamestnancov, ktorí odišli v priebehu roka**

|  | Meno s titulmi             | Dátum odchodu | Ročný prepočítaný úväzok |
|--|----------------------------|---------------|--------------------------|
| <b>Vedúci vedeckí pracovníci DrSc.</b> |                            |               |                          |
| 1.                                     | Ing. Karol Fröhlich, DrSc. | 30.6.2022     | 0.25                     |
| <b>Samostatní vedeckí pracovníci</b>   |                            |               |                          |
| 1.                                     | Ing. Jozef Huran, CSc.     | 30.6.2022     | 0.00                     |
| 2.                                     | Ing. Peter Lobotka, CSc.   | 31.12.2022    | 0.20                     |
| <b>Odborní pracovníci ÚSV</b>          |                            |               |                          |
| 1.                                     | Karol Schwarz              | 30.11.2022    | 0.46                     |
| 2.                                     | Margita Valentínová        | 30.6.2022     | 0.45                     |
| <b>Ostatní pracovníci</b>              |                            |               |                          |
| 1.                                     | Milan Kantner              | 30.6.2022     | 0.50                     |

**Zoznam doktorandov**

|  | Meno s titulmi                 | Škola/fakulta                               | Študijný odbor                               |
|--|--------------------------------|---|--|
| <b>Interní doktorandi hradení z prostriedkov SAV</b> |                                |   |  |
| 1.   | Ing. Michal Bennár             | Fakulta elektrotechniky a informatiky STU   | 5.2.48 fyzikálne inžinierstvo                |
| 2.   | Mgr. Konstantin Bublikov       | Fakulta matematiky, fyziky a informatiky UK | 4.1.3 fyzika kondenzovaných látok a akustika |
| 3.   | MSc. Ghazaleh Esmaeili Dehaghi | Fakulta elektrotechniky a informatiky STU   | 5.2.48 fyzikálne inžinierstvo                |
| 4.   | Mgr. Jana Hrdá                 | Fakulta elektrotechniky a informatiky STU   | 5.2.9 elektrotechnika                        |
| 5.   | Ing. Fedor Hrubíšák            | Fakulta elektrotechniky a informatiky STU   | 5.2.9 elektrotechnika                        |
| 6.   | MSc. Arif Hussain              | Fakulta elektrotechniky a informatiky STU   | 5.2.48 fyzikálne inžinierstvo                |
| 7.   | MSc. Javad Keshtar             | Fakulta elektrotechniky a informatiky STU   | 5.2.9 elektrotechnika                        |
| 8.   | Sergei Krylov                  | Fakulta matematiky, fyziky a informatiky UK | 4.1.3 fyzika kondenzovaných látok a akustika |
| 9.   | Ing. Martin Kucharovič         | Fakulta elektrotechniky a informatiky STU   | 5.2.9 elektrotechnika                        |
| 10.  | MSc. Saviz Parsa Saeb          | Fakulta elektrotechniky a informatiky STU   | 5.2.9 elektrotechnika                        |
| 11.  | Mgr. Michal Pecz               | Fakulta matematiky, fyziky a informatiky UK | 4.1.3 fyzika kondenzovaných látok a akustika |
| 12.  | Mgr. Tatiana Vojteková         | Fakulta matematiky, fyziky a informatiky UK | 4.1.1 fyzika                                 |
| <b>Interní doktorandi hradení z iných zdrojov</b>    |                                |   |  |
| 1.   | Ing. Marek Búran               | Fakulta elektrotechniky a informatiky STU   | 5.2.48 fyzikálne inžinierstvo                |
| 2.   | Mgr. Fridrich Egyenes          | Fakulta matematiky, fyziky a informatiky UK | 4.1.3 fyzika kondenzovaných látok a akustika |
| 3.   | Ing. Ondrej Pohorelec          | Fakulta elektrotechniky a informatiky STU   | 5.2.13 elektronika                           |
| 4.   | Mgr. Peter Šichman             | Fakulta matematiky, fyziky a informatiky UK | 4.1.3 fyzika kondenzovaných látok a akustika |
| 5.   | Mgr. Iuliia Vetrova            | Fakulta matematiky, fyziky a informatiky UK | 4.1.3 fyzika kondenzovaných látok a akustika |
| <b>Externí doktorandi</b>                            |                                |   |  |
| 1.   | Ing. Ivan Kundrata             | Fakulta matematiky, fyziky a informatiky UK | 4.1.3 fyzika kondenzovaných látok a akustika |

**Zoznam zamestnancov prijatých do jedného roka od získania PhD.**

|  | Meno s titulmi | Dátum obhajoby | Dátum prijatia | Úväzok (v %) |
|--|----------------|----------------|----------------|--------------|
|--|----------------|----------------|----------------|--------------|

**Zoznam emeritných vedeckých zamestnancov**

|    | Meno s titulmi               |
|----|------------------------------|
| 1. | Ing. František Dubecký, CSc. |

## **Príloha B**

### **Projekty riešené v organizácii**

#### **Medzinárodné projekty**

#### **Programy: COST**

##### **1.) Európska sieť pre inovatívnu a pokročilú epitaxiu (*European Network for Innovative and Advanced Epitaxy*)**

|   |   |
|---|---|
| <b>Zodpovedný riešiteľ:</b>                   | Ján Kuzmík  |
| <b>Trvanie projektu:</b>                      | 1.11.2021 / 30.10.2025  |
| <b>Evidenčné číslo projektu:</b>              | CA20116   |
| <b>Organizácia je koordinátorom projektu:</b> | nie   |
| <b>Koordinátor:</b>                           | Centre des Nanosciences et des Nanotechnologies, C2N-CNRS-UMR9001, Université Paris-Saclay, France  |
| <b>Počet spoluriešiteľských inštitúcií:</b>   | 31 - Rakúsko: 1, Belgicko: 1, Bulharsko: 1, Bosna a Hercegovina: 1, Cyprus: 1, Česko: 1, Nemecko: 1, Dánsko: 1, Španielsko: 1, Estónsko: 1, Fínsko: 1, Veľká Británia: 1, Grécko: 1, Chorvátsko: 1, Maďarsko: 1, Švajčiarsko: 1, Írsko: 1, Izrael: 1, Taliansko: 1, Litva: 1, Luxembursko: 1, Lotyšsko: 1, Moldavsko: 1, Holandsko: 1, Nórsko: 1, Poľsko: 1, Portugalsko: 1, Rumunsko: 1, Srbsko: 1, Švédsko: 1, Turecko: 1 |
| <b>Čerpané financie:</b>                      | -<br>Podpora medzinárodnej spolupráce z národných zdrojov: 3333 €   |

##### **2.) Ultrarýchla magneto-optoelektronika pre nedisipatívnu informačnú technológiu (*Ultrafast opto-magneto-electronics for non-dissipative information technology*)**

|   |   |
|---|---|
| <b>Zodpovedný riešiteľ:</b>                   | Michał Mruczkiewicz   |
| <b>Trvanie projektu:</b>                      | 3.10.2018 / 2.10.2022   |
| <b>Evidenčné číslo projektu:</b>              | CA17123   |
| <b>Organizácia je koordinátorom projektu:</b> | nie   |
| <b>Koordinátor:</b>                           | Radboud University, Nijmegen  |
| <b>Počet spoluriešiteľských inštitúcií:</b>   | 33 - Belgicko: 1, Bulharsko: 2, Česko: 3, Nemecko: 1, Dánsko: 2, Španielsko: 1, Fínsko: 1, Francúzsko: 2, Veľká Británia: 1, Grécko: 2, Chorvátsko: 1, Maďarsko: 1, Švajčiarsko: 1, Island: 2, Taliansko: 2, Holandsko: 1, Nórsko: 1, Poľsko: 1, Portugalsko: 1, Rumunsko: 1, Srbsko: 2, Slovinsko: 1, Švédsko: 1, Turecko: 1 |
| <b>Čerpané financie:</b>                      | -   |

##### **3.) Vysokoteplotná supravodivosť pre zrýchlenie prechodu k čistejšej energii (*High-TeHigh-Temperature SuperConductivity for AcceLerating the Energy Transitionmperature SuperConductivity for AcceLerating the Energy Transition*)**

|   |                       |
|---|-----------------------|
| <b>Zodpovedný riešiteľ:</b>                   | Enric Pardo           |
| <b>Trvanie projektu:</b>                      | 8.10.2020 / 7.10.2024 |
| <b>Evidenčné číslo projektu:</b>              | CA19108               |
| <b>Organizácia je koordinátorom projektu:</b> | nie                   |

**Koordinátor:** NOVA.ID.FCT , Caparica  
**Počet spoluriešiteľských inštitúcií:** 27 - Rakúsko: 1, Belgicko: 1, Bulharsko: 1, Bosna a Hercegovina: 1, Brazília: 1, Nemecko: 1, Dánsko: 1, Španielsko: 3, Fínsko: 1, Francúzsko: 1, Veľká Británia: 1, Grécko: 1, Izrael: 1, Taliansko: 1, Luxembursko: 1, Poľsko: 1, Portugalsko: 2, Rumunsko: 1, Srbsko: 2, Slovinsko: 1, Turecko: 2, Ukrajina: 1  
**Čerpané financie:** -  
Podpora medzinárodnej spolupráce z národných zdrojov: 2500 €

## Programy: EUREKA

### 4.) Filamentované pásky z vysokoteplotného supravodiča pre použitie vo fúzii (*Filamentized high temperature superconductor tapes for fusion*)

**Zodpovedný riešiteľ:** Fedor Gömöry  
**Trvanie projektu:** 1.10.2021 / 31.5.2024  
**Evidenčné číslo projektu:** Eurostars 2 - E115264  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** SUBRA A/S  
**Počet spoluriešiteľských inštitúcií:** 2 - Nemecko: 1, Dánsko: 1  
**Čerpané financie:** MŠ: 102872 €

#### Dosiahnuté výsledky:

Gömöry, F.: Probability of premature quenching of HTS coil due to local reduction of critical current, IEEE Trans. Applied Supercond. 32 (2022) 4604005.

## Programy: International Visegrad Fund (IVF)

### 5.) Projektovanie šírky zakázaného pásu v nekonvenčných polovodičoch (*Band-gap engineering in unconventional semiconductors*)

**Zodpovedný riešiteľ:** Viera Skákalová  
**Trvanie projektu:** 1.1.2022 / 31.12.2024  
**Evidenčné číslo projektu:**  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** Dr. Ryo Kitaura  
**Počet spoluriešiteľských inštitúcií:** 4 - Česko: 1, Maďarsko: 1, Japonsko: 1, Poľsko: 1  
**Čerpané financie:** -

## Programy: Bilaterálne - iné

### 6.) Dichalkogenidy prechodových kovov s topologickými fázami: predikcie, syntéza a vlastnosti (*Topological transition-metal dichalcogenides: prediction, synthesis and properties*)

**Zodpovedný riešiteľ:** Martin Hulman  
**Trvanie projektu:** 1.4.2021 / 31.12.2022  
**Evidenčné číslo projektu:** SASA-SAS 21-02  
**Organizácia je** áno

**koordinátorom projektu:**

**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** SAV: 567 €

**7.) Príprava a charakterizácia veľmi tenkých vrstiev TMD materiálov na atomárnej škále**  
*(The preparation and atomic-scale characterization of ultrathin films of TMD materials)*

**Zodpovedný riešiteľ:** Martin Hulman  
**Trvanie projektu:** 1.4.2021 / 31.12.2022  
**Evidenčné číslo projektu:** SK-AT-20-0020  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** -

**8.) Optimalizácia škálovateľného rastu tenkých vrstiev dichalkogenidov prechodných kovov a nové heteroštruktúry na použitie v elektronike a pokročilé senzory**  
*(Optimization of the scalable growth of transition metal dichalcogenide thin films and novel heterostructures for application in electronics and advanced sensors)*

**Zodpovedný riešiteľ:** Michaela Sojková  
**Trvanie projektu:** 1.1.2021 / 31.12.2022  
**Evidenčné číslo projektu:** SAV-CNR  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** SAV: 3000 €  
Podpora medzinárodnej spolupráce z národných zdrojov: 3000 €

*Dosiahnuté výsledky:*

Vegso, K., Shaji, A., Sojková, M., Pribusová Slušná, L., Vojteková, T., Hrdá, J., Halahovets, Y., Hulman, M., Jergel, M., Majková, E., Wiesmann, J., and Šiffalovič, P.: A wide-angle X-ray scattering laboratory setup for tracking phase changes of thin films in a chemical vapor deposition chamber, Rev. Sci Instrum. 93 (2022) 113909.

Shaji, A., Vegso, K., Sojková, M., Hulman, M., Nádaždy, P., Halahovets, Y., Pribusová Slušná, L., Vojteková, T., Hrdá, J., Jergel, M., Majková, E., Wiesmann, J., and Šiffalovič, P.: Stepwise sulfurization of MoO<sub>3</sub> to MoS<sub>2</sub> thin films studied by real-time X-ray scattering, Applied Surface Sci 606 (2022) 154772.

**9.) Pulzná laserová depozícia 2D polovodičov na nitridy pre pokročilú elektroniku**  
*(PULSED laser deposition of 2D semiconductors on nitrides for advanced electronics)*

**Zodpovedný riešiteľ:** Marianna Španková  
**Trvanie projektu:** 1.1.2021 / 31.12.2022  
**Evidenčné číslo projektu:** SAV-CNR

**Organizácia je** áno  
**koordinátorom projektu:**  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských** 0  
**inštitúcií:**  
**Čerpané financie:** -  
Podpora medzinárodnej spolupráce z národných zdrojov: 3000 €

Dosiahnuté výsledky:

Giannazzo, F., Panasci, S.E., Schiliró, E., Fiorenza, P., Greco, G., Roccaforte, F., Cannas, M., Agnello, S., Koos, A., Pécz, B., Španková, M., and Chromik, Š.: Highly homogeneous 2D/3D heterojunction diodes by pulsed laser deposition of MoS<sub>2</sub> on ion implantation doped 4H-SiC, Adv. Mater. Interfaces (2023) 2201502.

**10.) Syntéza a charakterizácia funkčných heteroštruktúr 2D TMD-diamant pre senzorové prvky** (*Synthesis and characterization of 2D TMD-diamond functional heterostructures for sensing elements*)

**Zodpovedný riešiteľ:** Gabriel Vanko  
**Trvanie projektu:** 1.1.2021 / 31.12.2022  
**Evidenčné číslo projektu:**  
**Organizácia je** áno  
**koordinátorom projektu:**  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských** 0  
**inštitúcií:**  
**Čerpané financie:** -

Dosiahnuté výsledky:

Vanko, G., Andok, R., Tomáška, M., Wu, S.-R., Vojs, M., Hudec, B., Marton, M., Řeháček, V., Kromka, A., Izsák, T., Chen, Y.-H., and Tsai, H.-Y.: Diamond-based RF MEMS microheaters for insects behavior monitoring. In Proc. 10<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. M. Feiler et al. Žilina: EDIS 2022. ISBN 978-80-554-1884-1. P. 145-148.

**Programy: ERANET**

**11.) Epitaxné vrstvy tranzitných kovov dichalkogenidov pripravených na polovodičoch so širokým zakázaným pásmom pre modernú elektroniku** (*Epitaxial transition metal dichalcogenides onto wide bandgap hexagonal superconductors for advanced electronics*)

**Zodpovedný riešiteľ:** Štefan Chromik  
**Trvanie projektu:** 1.4.2020 / 31.3.2023  
**Evidenčné číslo projektu:** FLAG-ERA III/2019/884/ETMOS  
**Organizácia je** nie  
**koordinátorom projektu:**  
**Koordinátor:** Consiglio Nazionale delle Ricerche – Istituto per la Microelettronica e Microsistemi  
**Počet spoluriešiteľských** 4 - Francúzsko: 1, Maďarsko: 1, Taliansko: 2  
**inštitúcií:**  
**Čerpané financie:** -  
Podpora medzinárodnej spolupráce z národných zdrojov: 25000 €

Dosiahnuté výsledky:

Giannazzo, F., Panasci, S.E., Schiliró, E., Fiorenza, P., Greco, G., Roccaforte, F., Cannas, M., Agnello, S., Koos, A., Pécz, B., Španková, M., and Chromik, Š.: Highly homogeneous 2D/3D heterojunction diodes by pulsed laser deposition of MoS<sub>2</sub> on ion implantation doped 4H-SiC, Adv. Mater. Interfaces (2023) 2201502.

**Programy: Horizont 2020**

**12.) 3D ploter na báze nanášania po atómových vrstvách** (*The atomic-layer 3D plotter*)

**Zodpovedný riešiteľ:** Karol Fröhlich  
**Trvanie projektu:** 1.5.2020 / 30.4.2022  
**Evidenčné číslo projektu:** ID: 950785  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** Friedrich-Alexander-Universitaet Erlangen-Nuernberg  
**Počet spoluriešiteľských inštitúcií:** 3 - Nemecko: 1, Dánsko: 1, Litva: 1  
**Čerpané financie:** -

Dosiahnuté výsledky:

Kundrata, I., Barr, M.K.S., Tymek, S., Döhler, D., Hudec, B., Brünner, P., Vanko, G., Precner, M., Yokosawa, T., Spiecker, E., Plakhotnyuk, M., Fröhlich, K., and Bachmann, J.: Additive manufacturing in atomic layer processing mode, Small Methods (2022) 2101546.

**13.) Uskutočňovanie aktivít popísaných v Ceste k fúzii počas Horizon2020 cestou spoločného programu členov konzorcia EUROfusion** (*Implementation of activities described in the Roadmap to Fusion during Horizon2020 through a Joint programme of the EUROfusion consortium*)

**Zodpovedný riešiteľ:** Fedor Gömöry  
**Trvanie projektu:** 1.1.2014 / 31.12.2022  
**Evidenčné číslo projektu:** H2020-633053  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** Max-Planck Gesellschaft zur Forderung der Wissenschaften E.V.  
**Počet spoluriešiteľských inštitúcií:** 31 - Rakúsko: 1, Belgicko: 0, Bulharsko: 0, Cyprus: 0, Česko: 2, Nemecko: 3, Dánsko: 1, Španielsko: 2, Estónsko: 2, Fínsko: 1, Francúzsko: 1, Veľká Británia: 1, Grécko: 3, Chorvátsko: 1, Maďarsko: 1, Švajčiarsko: 1, Írsko: 1, Taliansko: 1, Litva: 1, Lotyšsko: 1, Holandsko: 1, Poľsko: 1, Portugalsko: 1, Rumunsko: 1, Slovensko: 1, Slovinsko: 1, Švédsko: 1  
**Čerpané financie:** -

**14.) Supravodivé magnety pre European Magnet Field Laboratory** (*Superconducting magnets for the European Magnet Field Laboratory*)

**Zodpovedný riešiteľ:** Enric Pardo  
**Trvanie projektu:** 1.1.2021 / 31.12.2024  
**Evidenčné číslo projektu:** H2020-951714  
**Organizácia je koordinátorom projektu:** nie



**Koordinátor:** Centre National De La Recherche Scientifique CNRS  
**Počet spoluriešiteľských inštitúcií:** 9 - Belgicko: 1, Nemecko: 3, Francúzsko: 1, Veľká Británia: 1, Švajčiarsko: 1, Holandsko: 2  
**Čerpané financie:** -  
Podpora medzinárodnej spolupráce z národných zdrojov: 3500 €

**15.) Podpora inovácií v urýchľovačovom výskume a technológií** (*Innovation Fostering in Accelerator Science and Technology*)

**Zodpovedný riešiteľ:** Eugen Seiler  
**Trvanie projektu:** 1.5.2021 / 30.4.2025  
**Evidenčné číslo projektu:** H2020-101004730  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** European Organization For Nuclear Research - CERN  
**Počet spoluriešiteľských inštitúcií:** 20 - Rakúsko: 1, Nemecko: 2, Španielsko: 2, Estónsko: 1, Francúzsko: 4, Veľká Británia: 1, Maďarsko: 1, Švajčiarsko: 2, Taliansko: 1, Lotyšsko: 1, Holandsko: 1, Poľsko: 1, Slovensko: 1, Švédsko: 1  
**Čerpané financie:** EÚ: 13889 €  
Podpora medzinárodnej spolupráce z národných zdrojov: 3500 €

Dosiahnuté výsledky:

Ries, R., Seiler, E., Gömöry, F., Medvids, A., Onufrijevs, P., Pira, C., Chyhyrynets, E., Malyshev, O.B., and Valizadeh, R.: Surface quality characterization of thin Nb films for superconducting radiofrequency cavities, Supercond. Sci Technol. 35 (2022) 075010.

**Programy: Horizont Európa**

**16.) Supravodivé káble podporujúce prechod na udržateľnú energetiku** (*Superconducting cables for sustainable energy transition*)

**Zodpovedný riešiteľ:** Fedor Gömöry  
**Trvanie projektu:** 1.9.2022 / 28.2.2027  
**Evidenčné číslo projektu:** H EU-101075602  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** SINTEF ENERGI AS, Trondheim  
**Počet spoluriešiteľských inštitúcií:** 13 - Nemecko: 3, Francúzsko: 4, Írsko: 1, Taliansko: 4, Portugalsko: 1  
**Čerpané financie:** -

**17.) Heterogenná materiálová a technologická platforma pre novú doménu výkonovej nanoelektroniky** (*Heterogeneous Material and Technological Platform for a New Domain of Power Nanoelectronics*)

**Zodpovedný riešiteľ:** Ján Kuzmík  
**Trvanie projektu:** 1.12.2022 / 30.11.2025  
**Evidenčné číslo projektu:** 101091433  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** THALES

**Počet spoluriešiteľských inštitúcií:** 10 - Nemecko: 2, Španielsko: 1, Veľká Británia: 1, Grécko: 3, Taliansko: 1, Rumunsko: 1, Švédsko: 1  
**Čerpané financie:** -

## **Programy: EDF**

### **18.) Európska inovatívna pokročilá GaN mikrovlnná integrácia** (*European Innovative GaN Advanced Microwave Integration*)

**Zodpovedný riešiteľ:** Ján Kuzmík  
**Trvanie projektu:** 15.12.2022 / 14.12.2026  
**Evidenčné číslo projektu:** 101102983  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** United Monolithic Semiconductors GmbH  
**Počet spoluriešiteľských inštitúcií:** 15 - Belgicko: 1, Nemecko: 2, Španielsko: 3, Fínsko: 1, Francúzsko: 1, Grécko: 1, Chorvátsko: 1, Taliansko: 2, Litva: 1, Holandsko: 1, Švédsko: 1  
**Čerpané financie:** -

## **Domáce projekty**

## **Programy: VEGA**

### **1.) Transport magnetických skyrmiónov v antidot mriežkach: Efekt teploty a kombinácie rôznych transportných mechanizmov** (*Transport of magnetic skyrmions in antidot lattices: Effect of temperature and combination of transport mechanisms*)

**Zodpovedný riešiteľ:** Juraj Feilhauer  
**Trvanie projektu:** 1.1.2021 / 31.12.2023  
**Evidenčné číslo projektu:** 2/0177/21  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** VEGA: 3391 €

### **2.) Tepelná stabilizácia vysokoteplotných supravodivých pások pre použitie v obmedzovačoch skratových prúdov** (*Thermal stabilization of high-temperature superconducting tapes for fault current limiters*)

**Zodpovedný riešiteľ:** Fedor Gömöry  
**Trvanie projektu:** 1.1.2021 / 31.12.2024  
**Evidenčné číslo projektu:** 1/0205/21  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** Materiálovotechnologická fakulta STU  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** VEGA: 3801 €

Dosiahnuté výsledky:

Cuninková, E., Pekarčíková, M., Mošať, M., and Skarba, M.: Numerical simulation of thermal stabilization used in HTS tapes for SCFCL application, IEEE Trans. Applied Supercond. 32 (2022) 5600805.

Gömöry, F.: Probability of premature quenching of HTS coil due to local reduction of critical current, IEEE Trans. Applied Supercond. 32 (2022) 4604005.

Gömöry, F., Šouc, J., and Mošať, M.: Formation of hot spots in coated conductors during static and dynamic DC loading, IEEE Trans. Applied Supercond. 32 (2022) 5400207.

**3.) Výskum a vývoj kontaktov pre nové materiály a súčiastky** (*Contact engineering for advanced materials and devices*)

**Zodpovedný riešiteľ:** Dagmar Gregušová  
**Trvanie projektu:** 1.1.2021 / 31.12.2024  
**Evidenčné číslo projektu:** 2/0068/21  
**Organizácia je** áno  
**koordinátorom projektu:**  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** VEGA: 10729 €

Dosiahnuté výsledky:

Pohorelec, O., Hasenöhrl, S., Blaho, M., Stoklas, R., Dobročka, E., Nádaždy, P., Vincze, A., Eliáš, P., Kučera, M., Gucmann, F., Gregušová, D., and Kuzmík, J.: Mg doping in In-rich InAlN layers. In: Inter. Workshop on Nitride Semicond. (IWN 2022) Berlin 2022. Výveska.

**4.) Ultratenké homogénne povrchové vrstvy na štruktúrach komplexnej morfológie pre vylepšenie výkonu batérii využitím depozície po atómových vrstvách** (*Ultra-thin conformal surface coatings of complex-morphology structures for improving battery performance using atomic layer deposition*)

**Zodpovedný riešiteľ:** Boris Hudec  
**Trvanie projektu:** 1.1.2022 / 31.12.2025  
**Evidenčné číslo projektu:** 2/0162/22  
**Organizácia je** áno  
**koordinátorom projektu:**  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** VEGA: 9565 €

**5.) Supravodivé spoje pre MgB<sub>2</sub> vinutia v perzistentnom móde** (*Superconducting joints of MgB<sub>2</sub> wires for windings in persistent mode*)

**Zodpovedný riešiteľ:** Pavol Kováč  
**Trvanie projektu:** 1.1.2022 / 31.12.2025  
**Evidenčné číslo projektu:** 2/0017/22  
**Organizácia je** áno

**koordinátorom projektu:**

**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** VEGA: 14805 €

Dosiahnuté výsledky:

Búran, M., Kopera, L., and Kováč, P.: Transport measurement of MgB<sub>2</sub> wire under the sub-cooled water ice compared to other cooling conditions, Supercond. Sci Technol. 35 (2022) 105004.

**6.) Kritické aspekty rastu polovodičových štruktúr pre novú generáciu III-N súčiastok**  
(Critical aspects of the growth for a new generation of III-N devices)

**Zodpovedný riešiteľ:** Ján Kuzmík  
**Trvanie projektu:** 1.1.2022 / 31.12.2025  
**Evidenčné číslo projektu:** 2/0005/22  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** VEGA: 17409 €

Dosiahnuté výsledky:

Stoklas, R., Hasenöhrl, S., Dobročka, E., Gucmann, , and Kuzmík, J.: Electron transport properties in thin InN layers grown on InAlN, Mater. Sci Semicond. Process. 155 (2023) 107250.

Rosová, A., Dobročka, E., Eliáš, P., Hasenöhrl, S., Kučera, M., Gucmann, F., and Kuzmík, J.: In(Ga)N 3D growth on GaN-buffered on-axis and off-axis (0001) sapphire substrates by MOCVD, Nanomater. 12 (2022) 3496. IF 5.72, Q 1

Hasenöhrl, S., Blaho, M., Dobročka, E., Gucmann, F., Kučera, M., Nádaždy, P., Stoklas, R., and Kuzmík, J.: Growth of N-polar In-rich InAlN by MOCVD. In: Inter. Workshop on Nitride Semicond. (IWN 2022) Berlin 2022. VÝveska.

Šichman, P., Stoklas, R., Hasenöhrl, S., Gregušová, D., Ťapajna, M., Hudec, B., Haščík, Š., Hashizume, T., Chvála, A., Šatka, A., and Kuzmík, J.: Vertical GaN transistor with semi-insulating channel. In: Inter. Workshop on Nitride Semicond. (IWN 2022) Berlin 2022.

Hasenöhrl, S., Blaho, M., Dobročka, E., Gucmann, F., Kučera, M., Nádaždy, P., Stoklas, R., and Kuzmík, J.: Growth of N-polar In-rich InAlN by MOCVD. In 14<sup>th</sup> Topical Workshop on Heterostruct. Microel. Hiroshima 2022.

**7.) Nízkostratový supravodivý kábel typu CORC z REBCO vodičov** (Low-loss superconducting CORC-like cable from REBCO conductors)

**Zodpovedný riešiteľ:** Eugen Seiler  
**Trvanie projektu:** 1.1.2021 / 31.12.2023  
**Evidenčné číslo projektu:** 2/0036/21  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.

**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** VEGA: 19463 €

Dosiahnuté výsledky:

Dadhich, A., Li, S., Solovyov, M., Šouc, J., Mošať, M., and Pardo, E.: Reducing cross-field demagnetization of superconducting stacks by soldering in pairs, *Supercond. Sci Technol.* 35 (2022) 115001.

Kováč, J., Kopera, L., Pardo, E., Melišek, T., Ries, R., Berberich, E., Wolfstädler S., and Reis, T.: Measurement of AC loss down to 25 K in a REBCO racetrack coil for electrical aircraft motor, *Sci Reports* 12 (2022) 16454.

Ries, R., Seiler, E., Gömöry, F., Medvids, A., Onufrijevs, P., Pira, C., Chyhyrynets, E., Malyshev, O.B., and Valizadeh, R.: Surface quality characterization of thin Nb films for superconducting radiofrequency cavities, *Supercond. Sci Technol.* 35 (2022) 075010.

**8.) Príprava, charakterizácia a dopovanie ultratenkých vrstiev dichalkogenidov prechodných kovov** (*Fabrication, characterization, and doping of ultra-thin layers of transition metal dichalcogenides*)

**Zodpovedný riešiteľ:** Michaela Sojková  
**Trvanie projektu:** 1.1.2021 / 31.12.2024  
**Evidenčné číslo projektu:** 2/0059/21  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** VEGA: 15892 €

Dosiahnuté výsledky:

Shaji, A., Vegso, K., Sojková, M., Hulman, M., Nádaždy, P., Halahovets, Y., Pribusová Slušná, L., Vojteková, T., Hrdá, J., Jergel, M., Majková, E., Wiesmann, J., and Šiffalovič, P.: Stepwise sulfurization of MoO<sub>3</sub> to MoS<sub>2</sub> thin films studied by real-time X-ray scattering, *Applied Surface Sci* 606 (2022) 154772.

Kozak, A., Sojková, M., Gucmann, F., Bodík, M., Vegso, K., Dobročka, E., Píš, I., Bondino, F., Hulman, M., Šiffalovič, P., and Ľapajna, M.: Effect of the crystallographic c-axis orientation on the tribological properties of the few-layer PtSe<sub>2</sub>, *Applied Surface Sci* 605 (2022) 154883.

Dvurečenskij, A., Cigán, A., Lobotka, P., Radnóczy, G., Škrátek, M., Benyó, J., Kováčová, E., Majerová, M., and Maňka, J.: Colloids of HEA nanoparticles in an imidazolium-based ionic liquid prepared by magnetron sputtering: Structural and magnetic properties, *Alloys Compounds* 896 (2022) 163089.

Hrdá, J., Vojteková, T., Pribusová-Slušná, L., Dobročka, E., Hulman, M., Píš, I., and Sojková, M.: Influence of Li-doping on the structural properties of thin-layer MOS<sub>2</sub> films. In *Proc. 10<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT*. Eds. M. Feiler et al. Žilina: EDIS 2022. ISBN 978-80-554-1884-1. P. 85-88.

**9.) Vývoj UV senzora na báze GaN pre vesmírne aplikácie (*GaN-based heterostructure as a promising UV sensor for space application*)**

**Zodpovedný riešiteľ:** Roman Stoklas  
**Trvanie projektu:** 1.1.2019 / 31.12.2022  
**Evidenčné číslo projektu:** 2/0114/19  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** VEGA: 4989 €

Dosiahnuté výsledky:

Stoklas, R., Šichman, P., Hasenöhrl, S., Gregušová, D., Ľapajna, M., Hudec, B., Haščík, Š., and Kuzmík, J.: Interface states analysis of Al<sub>2</sub>O<sub>3</sub>/GaN MOS capacitors with semi-insulating C-doped GaN. In: ASDAM 2022. Eds. J. Marek et al. IEEE 2022. ISBN 978-1-6654-6977-7. P. 15-16.

**10.) Štúdium dynamiky magnetického víru pre využitie v súčiastkach (*Study of magnetic vortex dynamics for device applications*)**

**Zodpovedný riešiteľ:** Ján Šoltýs  
**Trvanie projektu:** 1.1.2022 / 31.12.2024  
**Evidenčné číslo projektu:** 2/0168/22  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** VEGA: 20296 €

Dosiahnuté výsledky:

Krylov, S., Vetrova, I., Feilhauer, J., Fedor, J., Dérier, J., Šoltýs, J., and Cambel, V.: Improved durable vortex core MFM tip, J. Magnet. Magn. Mater. 555 (2022) 169357.

**11.) Modifikácia vlastností supravodivých, feromagnetických oxidových vrstiev a štruktúr pre modernú elektroniku (*Modification of properties of superconducting, ferromagnetic, oxide films and structures for advanced electronics*)**

**Zodpovedný riešiteľ:** Marianna Španková  
**Trvanie projektu:** 1.1.2022 / 31.12.2025  
**Evidenčné číslo projektu:** 2/0140/22  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** VEGA: 3951 €

**12.) Elektronické a optoelektronické súčiastky na báze ultra-širokopásmového Ga<sub>2</sub>O<sub>3</sub> polovodiča** (*Electronic and optoelectronic devices based on ultra-wide bandgap Ga<sub>2</sub>O<sub>3</sub> semiconductor*)

**Zodpovedný riešiteľ:** Milan Ťapajna  
**Trvanie projektu:** 1.1.2021 / 31.12.2024  
**Evidenčné číslo projektu:** 2/0100/21  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** VEGA: 11643 €

Dosiahnuté výsledky:

Egyenes, F., Guemann, F., Rosová, A., Dobročka, E., Hušeková, K., Hrubíšák, F., Keshtkar, J., and Ťapajna, M.: Conductance anisotropy of MOCVD-grown  $\alpha$ -Ga<sub>2</sub>O<sub>3</sub> films caused by (010)  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> filament-shaped inclusions, J. Phys. D: Appl. Phys. 56 (2023) 045102.

Hrubíšák, F., Egyenes, F., Dobročka, E., Guemann, F., Hušeková, K., Keshtkar, J., and Ťapajna, M.: Growth and properties of Ga<sub>2</sub>O<sub>3</sub> on 4H-SiC using liquid-injection MOCVD. In Proc. 10<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. - ADEPT. Eds. M. Feiler et al. Žilina: EDIS 2022. ISBN 978-80-554-1884-1. P. 47-50.

Keshtkar, J., Hotovy, I., Guemann, F., Hušeková, K., Dobročka, E., Nádaždy, P., Egyenes, F., Mikolášek, M., and Ťapajna, M.: NiO thin films for solar-blind photodetectors: structure and electrical properties. In Proc. 10<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. - ADEPT. Eds. M. Feiler et al. Žilina: EDIS 2022. ISBN 978-80-554-1884-1. P. 113-116.

Hrubíšák, F., Hušeková, K., Egyenes, F., Guemann, F., Dobročka, E., Keshtkar, J., and Ťapajna, M.: Effects of repeated annealing in different atmospheres on surface morphology of  $\varepsilon$ - $\kappa$ -Ga<sub>2</sub>O<sub>3</sub> grown on c-plane sapphire using LI-MOCVD method. In: ELITECH'22: 24<sup>th</sup> Conf. Doctoral Students Ed. A. Kozáková. Bratislava: Spektrum STU, 2022. ISBN 978-80-227-5192-6.

Keshtkar, J., Guemann, F., Hotový, I., Dobročka, E., Egyenes, F., and Ťapajna, M.: NiO thin films for solar-blind photodetectors: structure and electrical properties. In: ELITECH'22: 24<sup>th</sup> Conf. Doctoral Students Ed. A. Kozáková. Bratislava: Spektrum STU, 2022. ISBN 978-80-227-5192-6.

Hrubíšák, F., Hušeková, K., Egyenes, F., Rosová, A., Kubranská, A., Dobročka, E., Nádaždy, P., Keshtkar, J., Guemann, F., and Ťapajna, M.: Structural and electrical properties of Ga<sub>2</sub>O<sub>3</sub> transistors grown on 4H-SiC substrates. In: ASDAM 2022. Eds. J. Marek et al. IEEE 2022. ISBN 978-1-6654-6977-7. P. 115-118.

Egyenes, F., Guemann, F., Dobročka, E., Mikolášek, M., Hušeková, K., and Ťapajna, M.: Transport properties of Si-doped  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> grown by liquid-injection MOCVD. In: ASDAM 2022. Eds. J. Marek et al. IEEE 2022. ISBN 978-1-6654-6977-7. P. 119-122.

Dobročka, E., Rosová, A., Hušeková, K., Kubranská, A., Egyenes, F., Guemann, F., and Ťapajna, M.: Crystal structure of  $\varepsilon$ / $\kappa$ -Ga<sub>2</sub>O<sub>3</sub> epitaxial films grown by liquidinjection MOCVD on sapphire substrates. In E-MRS 2022 - Fall Meeting. Warsaw 2022. Výveska.

Gucmann, F., Hušeková, K., Dobročka, E., Nádaždy, P., Keshtar, J., Egyenes, F., Mikolášek, M., Fröhlich, K., and Ľapajna, M.: Growth of gallium oxide on 4H-SiC using liquid-injection MOCVD. In WOCSDICW 2022. Ponta Delgada 2022.

Gucmann, F., Hušeková, K., Dobročka, E., and Nádaždy, P.: Ga<sub>2</sub>O<sub>3</sub> vs heat: anisotropy, thermal stability, and heat removal. In E-MRS 2022 - Fall Meeting. Warsaw 2022. Vyžiadaná prednáška.

**13.) Vysokovýkonná zakrivená röntgenová optika pripravená pokročilou technológiou nanoobrábania** (*High-performance curved X-ray optics prepared by advanced nanomachining technology*)

**Zodpovedný riešiteľ:** Zdenko Zápražný  
**Trvanie projektu:** 1.1.2021 / 31.12.2023  
**Evidenčné číslo projektu:** 2/0041/21  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** VEGA: 3631 €

Dosiahnuté výsledky:

Vegso, K., Shaji, A., Sojková, M., Pribusová Slušná, L., Vojteková, T., Hrdá, J., Halahovets, Y., Hulman, M., Jergel, M., Majková, E., Wiesmann, J., and Šiffalovič, P.: A wide-angle X-ray scattering laboratory setup for tracking phase changes of thin films in a chemical vapor deposition chamber, Rev. Sci Instrum. 93 (2022) 113909.

Shaji, A., Vegso, K., Sojková, M., Hulman, M., Nádaždy, P., Halahovets, Y., Pribusová Slušná, L., Vojteková, T., Hrdá, J., Jergel, M., Majková, E., Wiesmann, J., and Šiffalovič, P.: Stepwise sulfurization of MoO<sub>3</sub> to MoS<sub>2</sub> thin films studied by real-time X-ray scattering, Applied Surface Sci 606 (2022) 154772.

**14.) Vysokoodolné polovodičové senzory ionizujúceho žiarenia pre využitie v radiačnom prostredí** (*Radiation resistant semiconductor sensors for utilization in harsh environment*)

**Zodpovedný riešiteľ:** Bohumír Zaťko  
**Trvanie projektu:** 1.1.2020 / 31.12.2023  
**Evidenčné číslo projektu:** 2/0084/20  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 1 - Slovensko: 1  
**Čerpané financie:** VEGA: 8734 €

Dosiahnuté výsledky:

Sedláčková, K., Zaťko, B., Šagátová, A., and Nečas, V.: Polarization effect of Schottky-barrier CdTe semiconductor detectors after electron irradiation, Nuclear Instr. Methods Phys. Res. A 1027 (2022) 166282.

Osvald, J., Hrubčín, L., and Zaťko, B.: Temperature dependence of electrical behaviour of inhomogeneous Ni/Au/4H-SiC Schottky diodes, Mater. Sci Semicond. Process. 140 (2022) 106413.



Osvald, J. and Zaťko, B.: Anomalous intersection point of Schottky diodes I-V curves measured at different temperatures. In Proc. 10<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. M. Feiler et al. Žilina: EDIS 2022. ISBN 978-80-554-1884-1. P. 133-136.

Huran, J., Boháček, P., Sasinková, V., Kleinová, A., Mikolášek, M., and Kobzev, A.P.: Amorphous silicon carbide thin films doped with P or B for the photoelectrochemical water splitting devices, Current Applied Phys. 34 (2022) 101-106.

Huran, J., Sasinková, V., Nozdrin, M.A., Kováčová, E., Kobzev, A.P., and Kleinová, A.: Photo-induced electron emission of nanostructured carbon thin film based transmission photocathodes at different electric field, Adv. Electr. Electron. Engn. 20 (2022) 108-114.

Huran, J., Skrypnik, A.P., Sasinková, V., Doroshkevich, A.S., Nozdrin, M.A., Kováčová, E., and Shirkov, G.D.: Effect of electric field on the photoelectron emission properties of very thin carbon films prepared by electron beam-plasma vacuum deposition. In Proc. 10<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. M. Feiler et al. Žilina: EDIS 2022. ISBN 978-80-554-1884-1. P. 129-132.

## **Programy: APVV**

### **15.) Optimalizácia okrúhleho kábla z vysokoteplotného supravodiča pre pulzné magnetické polia** (*Optimization of round high-temperature superconducting cable for pulse magnetic field*)

|   |                                      |
|---|--------------------------------------|
| <b>Zodpovedný riešiteľ:</b>                   | Fedor Gömöry                         |
| <b>Trvanie projektu:</b>                      | 1.7.2021 / 30.6.2025                 |
| <b>Evidenčné číslo projektu:</b>              | 20-0056                              |
| <b>Organizácia je koordinátorom projektu:</b> | nie                                  |
| <b>Koordinátor:</b>                           | Materiálovotechnologická fakulta STU |
| <b>Počet spoluriešiteľských inštitúcií:</b>   | 0                                    |
| <b>Čerpané financie:</b>                      | APVV: 24604 €                        |

#### Dosiahnuté výsledky:

Gömöry, F., Šouc, J., and Mošať, M.: Formation of hot spots in coated conductors during static and dynamic DC loading, IEEE Trans. Applied Supercond. 32 (2022) 5400207.

### **16.) Moderné nanomembránové heteroštruktúry na báze GaAs pre vysoko produktívne vysokofrekvenčné prvky** (*Advanced GaAs-based nanomembrane heterostructures for highperformance RF devices*)

|   |                      |
|---|----------------------|
| <b>Zodpovedný riešiteľ:</b>                   | Dagmar Gregušová     |
| <b>Trvanie projektu:</b>                      | 1.7.2022 / 30.6.2025 |
| <b>Evidenčné číslo projektu:</b>              | APVV-21-0365         |
| <b>Organizácia je koordinátorom projektu:</b> | nie                  |
| <b>Koordinátor:</b>                           | STU Bratislava       |
| <b>Počet spoluriešiteľských inštitúcií:</b>   | 0                    |
| <b>Čerpané financie:</b>                      | APVV: 16043 €        |

**17.) Nanoštrukturované tenkovrstvové materiály vyznačujúce sa slabými väzbovými interakciami pre elektronické a senzorické aplikácie** (*Nanostructured thin-film materials characterized by weak binding interactions for electronic and sensoric applications*)

**Zodpovedný riešiteľ:** Dagmar Gregušová  
**Trvanie projektu:** 1.7.2022 / 30.6.2026  
**Evidenčné číslo projektu:** APVV-21-0278  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** STU Bratislava  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** APVV: 11935 €

**18.) Moderné elektronické súčiastky na báze ultraširokopásmového polovodiča Ga<sub>2</sub>O<sub>3</sub> pre budúce vysokonapäťové aplikácie** (*Modern electronic devices based on ultrawide bandgap semiconducting Ga<sub>2</sub>O<sub>3</sub> for future high-voltage applications*)

**Zodpovedný riešiteľ:** Filip Gučmann  
**Trvanie projektu:** 1.7.2021 / 30.6.2025  
**Evidenčné číslo projektu:** 20-0220  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 2 - Slovensko: 2  
**Čerpané financie:** APVV: 29900 €

Dosiahnuté výsledky:

Egyenes, F., Gučmann, F., Rosová, A., Dobročka, E., Hušeková, K., Hrubíšák, F., Keshtkar, J., and Ľapajna, M.: Conductance anisotropy of MOCVD-grown  $\alpha$ -Ga<sub>2</sub>O<sub>3</sub> films caused by (010)  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> filament-shaped inclusions, J. Phys. D: Appl. Phys. 56 (2023) 045102.

Hrubíšák, F., Egyenes, F., Dobročka, E., Gučmann, F., Hušeková, K., Keshtkar, J., and Ľapajna, M.: Growth and properties of Ga<sub>2</sub>O<sub>3</sub> on 4H-SiC using liquid-injection MOCVD. In Proc. 10<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. - ADEPT. Eds. M. Feiler et al. Žilina: EDIS 2022. ISBN 978-80-554-1884-1. P. 47-50.

Keshtkar, J., Hotový, I., Gučmann, F., Hušeková, K., Dobročka, E., Nádaždy, P., Egyenes, F., Mikolášek, M., and Ľapajna, M.: NiO thin films for solar-blind photodetectors: structure and electrical properties. In Proc. 10<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. - ADEPT. Eds. M. Feiler et al. Žilina: EDIS 2022. ISBN 978-80-554-1884-1. P. 113-116.

Hrubíšák, F., Hušeková, K., Egyenes, F., Gučmann, F., Dobročka, E., Keshtkar, J., and Ľapajna, M.: Effects of repeated annealing in different atmospheres on surface morphology of  $\varepsilon$ -/ $\kappa$ -Ga<sub>2</sub>O<sub>3</sub> grown on c-plane sapphire using LI-MOCVD method. In: ELITECH'22: 24<sup>th</sup> Conf. Doctoral Students Ed. A. Kozáková. Bratislava: Spektrum STU, 2022. ISBN 978-80-227-5192-6.

Keshtkar, J., Gučmann, F., Hotový, I., Dobročka, E., Egyenes, F., and Ľapajna, M.: NiO thin films for solar-blind photodetectors: structure and electrical properties. In: ELITECH'22: 24<sup>th</sup> Conf. Doctoral Students Ed. A. Kozáková. Bratislava: Spektrum STU, 2022. ISBN 978-80-227-5192-6.

Hrubíšák, F., Hušeková, K., Egyenes, F., Rosová, A., Kubranská, A., Dobročka, E., Nádaždy, P., Keshtar, J., Gucmann, F., and Ľapajna, M.: Structural and electrical properties of Ga<sub>2</sub>O<sub>3</sub> transistors grown on 4H-SiC substrates. In: ASDAM 2022. Eds. J. Marek et al. IEEE 2022. ISBN 978-1-6654-6977-7. P. 115-118.

Egyenes, F., Gucmann, F., Dobročka, E., Mikolášek, M., Hušeková, K., and Ľapajna, M.: Transport properties of Si-doped  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> grown by liquid-injection MOCVD. In: ASDAM 2022. Eds. J. Marek et al. IEEE 2022. ISBN 978-1-6654-6977-7. P. 119-122.

Gucmann, F., Hušeková, K., Dobročka, E., and Nádaždy, P.: Ga<sub>2</sub>O<sub>3</sub> vs heat: anisotropy, thermal stability, and heat removal. In E-MRS 2022 - Fall Meeting. Warsaw 2022. Vyžiadaná prednáška.

Gucmann, F., Hušeková, K., Dobročka, E., Nádaždy, P., Keshtar, J., Egyenes, F., Mikolášek, M., Fröhlich, K., and Ľapajna, M.: Growth of gallium oxide on 4H-SiC using liquid-injection MOCVD. In WOCSIDICW 2022. Ponta Delgada 2022.

Dobročka, E., Rosová, A., Hušeková, K., Kubranská, A., Egyenes, F., Gucmann, F., and Ľapajna, M.: Crystal structure of  $\epsilon/\kappa$ -Ga<sub>2</sub>O<sub>3</sub> epitaxial films grown by liquid injection MOCVD on sapphire substrates. In E-MRS 2022 - Fall Meeting. Warsaw 2022. Výveska.

**19.) Vlastnosti tepelného transportu v budúcich perspektívnych polovodičových materiáloch a rozhraniach** (*Thermal transport properties of perspective future semiconductor materials and interfaces*)

|   |                                      |
|---|--------------------------------------|
| <b>Zodpovedný riešiteľ:</b>                   | Filip Gucmann                        |
| <b>Trvanie projektu:</b>                      | 1.1.2022 / 31.12.2023                |
| <b>Evidenčné číslo projektu:</b>              | SK-CN-21-0013                        |
| <b>Organizácia je koordinátorom projektu:</b> | áno                                  |
| <b>Koordinátor:</b>                           | Elektrotechnický ústav SAV, v. v. i. |
| <b>Počet spoluriešiteľských inštitúcií:</b>   | 0                                    |
| <b>Čerpané financie:</b>                      | APVV: 6000 €                         |

**20.) Metalické 2D dichalkogenidy prechodných kovov: príprava, štúdium vlastností a korelované stavy** (*Fabrication, physics and correlated states in metallic 2D transition metal dichalcogenides*)

|   |                                      |
|---|--------------------------------------|
| <b>Zodpovedný riešiteľ:</b>                   | Martin Hulman                        |
| <b>Trvanie projektu:</b>                      | 1.7.2020 / 30.6.2023                 |
| <b>Evidenčné číslo projektu:</b>              | 19-0365                              |
| <b>Organizácia je koordinátorom projektu:</b> | áno                                  |
| <b>Koordinátor:</b>                           | Elektrotechnický ústav SAV, v. v. i. |
| <b>Počet spoluriešiteľských inštitúcií:</b>   | 2 - Slovensko: 2                     |
| <b>Čerpané financie:</b>                      | APVV: 42710 €                        |

Dosiahnuté výsledky:

Gabinet, U., Lee, C., Kim, N.K., Hulman, M., Thompson, S.M., Kagan, C.R., and Osuji, C.O.: Magnetic field alignment and optical anisotropy of MoS<sub>2</sub> nanosheets dispersed in a liquid crystal polymer, J. Phys. Chem. Lett. 13 (2022) 7994–8001.

Vegso, K., Shaji, A., Sojková, M., Pribusová Slušná, L., Vojteková, T., Hrdá, J., Halahovets, Y., Hulman, M., Jergel, M., Majková, E., Wiesmann, J., and Šiffalovič, P.: A wide-angle X-ray scattering laboratory setup for tracking phase changes of thin films in a chemical vapor deposition chamber, *Rev. Sci Instrum.* 93 (2022) 113909.

Shaji, A., Vegso, K., Sojková, M., Hulman, M., Nádaždy, P., Halahovets, Y., Pribusová Slušná, L., Vojteková, T., Hrdá, J., Jergel, M., Majková, E., Wiesmann, J., and Šiffalovič, P.: Stepwise sulfurization of MoO<sub>3</sub> to MoS<sub>2</sub> thin films studied by real-time X-ray scattering, *Applied Surface Sci* 606 (2022) 154772.

Kozak, A., Sojková, M., Gucmann, F., Bodík, M., Vegso, K., Dobročka, E., Píš, I., Bondino, F., Hulman, M., Šiffalovič, P., and Ľapajna, M.: Effect of the crystallographic c-axis orientation on the tribological properties of the few-layer PtSe<sub>2</sub>, *Applied Surface Sci* 605 (2022) 154883.

**21.) Dlhodosahový jav blízkosti v supravodič/feromagnet heteroštruktúrach** (*Long-range proximity effect in superconductor / ferromagnet heterostructures*)

**Zodpovedný riešiteľ:** Štefan Chromík  
**Trvanie projektu:** 1.7.2020 / 31.12.2023  
**Evidenčné číslo projektu:** 19-0303  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** FMFI UK  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** APVV: 24000 €

**22.) Supravodivé vinutia z homogénnych MgB<sub>2</sub> drôtov s trubičkovými vláknami** (*Superconducting coils made of uniform MgB<sub>2</sub> wires with tubular filaments*)

**Zodpovedný riešiteľ:** Pavol Kováč  
**Trvanie projektu:** 1.7.2019 / 30.11.2022  
**Evidenčné číslo projektu:** 18-0271  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** APVV: 53511 €

Dosiahnuté výsledky:

Búran, M., Kopera, L., and Kováč, P.: Transport measurement of MgB<sub>2</sub> wire under the sub-cooled water ice compared to other cooling conditions, *Supercond. Sci Technol.* 35 (2022) 105004.

Kováč, P., Kopera, L., Berek, D., Hain, M., Melišek, T., Hušek, I., Kováč, J., and Búran, M.: High-current-density Rutherford MgB<sub>2</sub> cable sheathed by CuNi<sub>3</sub>O alloy, *Supercond. Sci Technol.* 35 (2022) 115003.

**23.) p-GaN elektronika pre úsporu energie a post-CMOS obvody** (*p-GaN electronics for energy savings and beyond-CMOS circuits*)

**Zodpovedný riešiteľ:** Ján Kuzmík  
**Trvanie projektu:** 1.7.2022 / 30.6.2025  
**Evidenčné číslo projektu:** APVV-21-0008  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 1 - Slovensko: 1  
**Čerpané financie:** APVV: 33500 €

**24.) Vertikálny GaN MOSFET pre výkonové spínacie aplikácie** (*Vertical GaN MOSFET for power switching applications*)

**Zodpovedný riešiteľ:** Ján Kuzmík  
**Trvanie projektu:** 1.7.2019 / 30.6.2022  
**Evidenčné číslo projektu:** 18-0054  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 1 - Slovensko: 1  
**Čerpané financie:** APVV: 29340 €

Dosiahnuté výsledky:

Kuzmík, J.: Vertikálny GaN tranzistor s izolačným kanálom a spôsob jeho prípravy. SK patent č. 289027.

Šichman, P., Stoklas, R., Hasenöhrl, S., Gregušová, D., Ťapajna, M., Hudec, B., Haščík, Š., Hashizume, T., Chvála, A., Šatka, A., and Kuzmík, J.: Vertical GaN transistor with semi-insulating channel. In: Inter. Workshop on Nitride Semicond. (IWN 2022) Berlin 2022.

Priesol, J., Šatka, A., Chvála, A., Šichman, P., Hasenöhrl, S., Kuzmík, J., and Uherek, F.: EBIC analysis of semi-insulating GaN/Si-doped GaN-on-GaN test structures for vertical GaN transistors. In WOCSDICW 2022. Ponta Delgada 2022. Výveska.

**25.) Časovo-rozlišené štúdium rastu hybridných van der Waalsových heteroštruktúr** (*Real-time grow studies of hybrid van der Waals heterostructures*)

**Zodpovedný riešiteľ:** Nad'a Mrk'vková  
**Zodpovedný riešiteľ v organizácii SAV:** Martin Hulman  
**Trvanie projektu:** 1.8.2018 / 30.6.2022  
**Evidenčné číslo projektu:** 17-0352  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** Centrum pre využitie pokročilých materiálov SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** APVV: 6686 €

Dosiahnuté výsledky:

Shaji, A., Vegso, K., Sojková, M., Hulman, M., Nádaždy, P., Halahovets, Y., Pribusová Slušná, L., Vojteková, T., Hrdá, J., Jergel, M., Majková, E., Wiesmann, J., and Šiffalovič, P.: Stepwise sulfurization of MoO<sub>3</sub> to MoS<sub>2</sub> thin films studied by real-time X-ray scattering, Applied Surface Sci 606 (2022) 154772.

**26.) Robustné spinové vlny pre budúce magnonické aplikácie** (*Robust spin waves for future magnonic applications*)

**Zodpovedný riešiteľ:** Michal Mruczkiewicz  
**Trvanie projektu:** 1.7.2020 / 30.6.2023  
**Evidenčné číslo projektu:** 19-0311  
**Organizácia je** áno  
**koordinátorom projektu:**  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 1 - Slovensko: 1  
**Čerpané financie:** APVV: 35562 €

Dosiahnuté výsledky:

Krylov, S., Vetrova, I., Feilhauer, J., Fedor, J., Dérier, J., Šoltýs, J., and Cambel, V.: Improved durable vortex core MFM tip, J. Magnet. Magn. Mater. 555 (2022) 169357.

**27.) Fotonické laboratórium na čipe: výskum a vývoj platformy plazmonického senzora pre okamžitú detekciu zložiek v roztokoch** (*Photonic Lab-on-a-Chip: investigation and development of plasmonic sensor platform for immediate detection of composites in solutions*)

**Zodpovedný riešiteľ:** Jozef Novák  
**Trvanie projektu:** 1.7.2021 / 31.12.2024  
**Evidenčné číslo projektu:** 20-0437  
**Organizácia je** nie  
**koordinátorom projektu:**  
**Koordinátor:** FEI STU Bratislava  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** APVV: 27330 €

Dosiahnuté výsledky:

Novák, J., Laurenčíková, A., Eliáš, P., Hasenöhrl, S., Sojková, M., Kováč, J.jr., and Kováč, J.: Investigation of a nanostructured GaP/MoS<sub>2</sub> p-n heterojunction photodiode, AIP Adv. 12 (2022) 065004.

Novák, J., Laurenčíková, A., Eliáš, P., Hasenöhrl, S., Sojková, M., Kováč, J.jr., and Kováč, J.: MOVPE growth of edge rich GaP surfaces for preparation of molybdenum disulphide. In Proc. 10<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. M. Feiler et al. Žilina: EDIS 2022. ISBN 978-80-554-1884-1. P. 21-24.

**28.) Nanooptické sondy a senzory integrované na optickom vlákne** (*Nano-optical probes and sensors integrated on optical fiber*)

**Zodpovedný riešiteľ:** Jozef Novák

**Trvanie projektu:** 1.8.2021 / 31.12.2024  
**Evidenčné číslo projektu:** 20-0264  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** Žilinská univerzita v Žiline  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** APVV: 26830 €

Dosiahnuté výsledky:

Novák, J., Laurenčíková, A., Eliáš, P., Hasenöhrl, S., Sojková, M., Kováč, J.jr., and Kováč, J.: Investigation of a nanostructured GaP/MoS<sub>2</sub> p-n heterojunction photodiode, AIP Adv. 12 (2022) 065004.

Novák, J., Laurenčíková, A., Eliáš, P., Hasenöhrl, S., Sojková, M., Kováč, J.jr., and Kováč, J.: MOVPE growth of edge rich GaP surfaces for preparation of molybdenum disulphide. In Proc. 10<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. M. Feiler et al. Žilina: EDIS 2022. ISBN 978-80-554-1884-1. P. 21-24.

**29.) Vysokoteplotná supravodivá cievka pre motory elektrických a hybridných lietadiel** (*High temperature superconducting coils in motors for electric and hybrid aircrafts*)

**Zodpovedný riešiteľ:** Enric Pardo  
**Trvanie projektu:** 1.7.2020 / 30.6.2023  
**Evidenčné číslo projektu:** 19-0536  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** APVV: 84896 €

Dosiahnuté výsledky:

Kováč, J., Kopera, L., Pardo, E., Melišek, T., Ries, R., Berberich, E., Wolfstädler S., and Reis, T.: Measurement of AC loss down to 25 K in a REBCO racetrack coil for electrical aircraft motor, Sci Reports 12 (2022) 16454.

Dadhich, A., Li, S., Solovyov, M., Šouc, J., Mošat', M., and Pardo, E.: Reducing cross-field demagnetization of superconducting stacks by soldering in pairs, Supercond. Sci Technol. 35 (2022) 115001.

**30.) Formovanie farebných centier v diamante a ich vlastností smerom ku kvantovej detekcii** (*Evolution of colour centres in diamond and their properties towards quantum detection*)

**Zodpovedný riešiteľ:** Viera Skákalová  
**Zodpovedný riešiteľ v organizácii SAV:** Marian Varga  
**Trvanie projektu:** 1.7.2021 / 31.12.2024  
**Evidenčné číslo projektu:** 20-0398  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** Centrum pre využitie pokročilých materiálov SAV, v. v. i.

**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** -

**31.) Topologicky netriviálne magnetické a supravodivé nanoštruktúry** (*Topologically nontrivial magnetic and superconducting nanostructures*)

**Zodpovedný riešiteľ:** Ján Šoltýs  
**Trvanie projektu:** 1.7.2021 / 31.12.2024  
**Evidenčné číslo projektu:** 20-0425  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** Prírodovedecká fakulta, UPJŠ Košice  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** APVV: 15040 €

**32.) Tranzistory na báze 2D kovových chalkogenidov pripravených teplom podporovanou konverziou** (*Transistors based on 2D Metal Chalcogenides Grown via Thermally Assisted Conversion*)

**Zodpovedný riešiteľ:** Milan Ľapajna  
**Trvanie projektu:** 1.7.2022 / 30.6.2026  
**Evidenčné číslo projektu:** APVV-21-0231  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 1 - Slovensko: 1  
**Čerpané financie:** APVV: 18612 €

**33.) Tribologické vlastnosti 2D materiálov a príbuzných nanokompozitov** (*Tribological properties of 2D materials and related nanocomposites*)

**Zodpovedný riešiteľ:** Milan Ľapajna  
**Zodpovedný riešiteľ v organizácii SAV:** Martin Hulman  
**Trvanie projektu:** 1.8.2018 / 30.6.2022  
**Evidenčné číslo projektu:** 17-0560  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** Centrum pre využitie pokročilých materiálov SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** APVV: 6686 €

Dosiahnuté výsledky:

Shaji, A., Vegso, K., Sojková, M., Hulman, M., Nádaždy, P., Halahovets, Y., Pribusová Slušná, L., Vojteková, T., Hrdá, J., Jergel, M., Majková, E., Wiesmann, J., and Šiffalovič, P.: Stepwise sulfurization of MoO<sub>3</sub> to MoS<sub>2</sub> thin films studied by real-time X-ray scattering, *Applied Surface Sci* 606 (2022) 154772.



Kozak, A., Sojková, M., Gucmann, F., Bodík, M., Vegso, K., Dobročka, E., Píš, I., Bondino, F., Hulman, M., Šiffalovič, P., and Ľapajna, M.: Effect of the crystallographic c-axis orientation on the tribological properties of the few-layer PtSe<sub>2</sub>, Applied Surface Sci 605 (2022) 154883.

**34.) Pokročilé mikromechanické nosníky zo širokopásmových polovodičových materiálov**  
(*Advanced Microcantilevers from Wide Bandgap Materials*)

**Zodpovedný riešiteľ:** Gabriel Vanko  
**Trvanie projektu:** 1.3.2020 / 31.12.2022  
**Evidenčné číslo projektu:** DS-FR-19-0051  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 2 - Rakúsko: 1, Česko: 1, Francúzsko: 0  
**Čerpané financie:** APVV: 5000 €

Dosiahnuté výsledky:

Vanko, G., Andok, R., Tomáška, M., Wu, S.-R., Vojs, M., Hudec, B., Marton, M., Řeháček, V., Kromka, A., Izsák, T., Chen, Y.-H., and Tsai, H.-Y.: Diamond-based RF MEMS microheaters for insects behavior monitoring. In Proc. 10<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. M. Feiler et al. Žilina: EDIS 2022. ISBN 978-80-554-1884-1. P. 145-148.

**35.) Zberač energie na báze mikrostĺpikovitých štruktúr** (*Energy Harvesting Device Based on Micropillar Structures*)

**Zodpovedný riešiteľ:** Gabriel Vanko  
**Trvanie projektu:** 1.1.2022 / 31.12.2023  
**Evidenčné číslo projektu:** SK-TW-21-0006  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 1 - Taiwan: 1  
**Čerpané financie:** APVV: 5000 €

**36.) Modifikácia vlastností supravodivých, feromagnetických oxidových vrstiev a štruktúr pre modernú elektroniku** (*Growth and Radiation Mechanisms in Diamond Hybrid Detectorsd Radiation Mechanisms in Diamond Hybrid Detectors*)

**Zodpovedný riešiteľ:** Bohumír Zaťko  
**Trvanie projektu:** 1.7.2022 / 30.6.2025  
**Evidenčné číslo projektu:** SK-CZ-RD\_21/0016  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 1 - Česko: 1  
**Čerpané financie:** -

**37.) Perspektívne polovodičové detektory pre využitie v jadrovej fyzike** (*Perspective semiconductor detector for nuclear physics*)

**Zodpovedný riešiteľ:** Bohumír Zaťko  
**Trvanie projektu:** 1.3.2022 / 31.12.2024  
**Evidenčné číslo projektu:** SK-RU-21-0002  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 1 - Slovensko: 1  
**Čerpané financie:** -

**38.) Radiačne odolnejší senzor pre RTG zobrazovanie vyššej kvality** (*Radiation harder sensor for X-ray imaging of higher quality*)

**Zodpovedný riešiteľ:** Bohumír Zaťko  
**Trvanie projektu:** 1.7.2019 / 30.6.2023  
**Evidenčné číslo projektu:** 18-0273  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** Ústav jadrového a fyzikálneho inžinierstva FEI STU  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** APVV: 25932 €

Dosiahnuté výsledky:

Sedláčková, K., Zaťko, B., Šagátová, A., and Nečas, V.: Polarization effect of Schottky-barrier CdTe semiconductor detectors after electron irradiation, Nuclear Instr. Methods Phys. Res. A 1027 (2022) 166282.

Huran, J., Sasinková, V., Nozdrin, M.A., Kováčová, E., Kobzev, A.P., and Kleinová, A.: Photo-induced electron emission of nanostructured carbon thin film based transmission photocathodes at different electric field, Adv. Electr. Electron. Engn. 20 (2022) 108-114.

Huran, J., Skrypnik, A.P., Sasinková, V., Doroshkevich, A.S., Nozdrin, M.A., Kováčová, E., and Shirkov, G.D.: Effect of electric field on the photoelectron emission properties of very thin carbon films prepared by electron beam-plasma vacuum deposition. In Proc. 10<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. M. Feiler et al. Žilina: EDIS 2022. ISBN 978-80-554-1884-1. P. 129-132.

Osvald, J. and Zaťko, B.: Anomalous intersection point of Schottky diodes I-V curves measured at different temperatures. In Proc. 10<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. M. Feiler et al. Žilina: EDIS 2022. ISBN 978-80-554-1884-1. P. 133-136.

**39.) Výskum radiačne odolných polovodičových detektorov pre jadrovú energetiku** (*Research of radiation resistant semiconductor detector for nuclear energies*)

**Zodpovedný riešiteľ:** Bohumír Zaťko  
**Trvanie projektu:** 1.7.2019 / 31.12.2022  
**Evidenčné číslo projektu:** 18-0243  
**Organizácia je** áno

**koordinátorom projektu:**

**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 1 - Slovensko: 1  
**Čerpané financie:** APVV: 36680 €

**Dosiahnuté výsledky:**

Osvald, J., Hrubčín, L., and Zaťko, B.: Temperature dependence of electrical behaviour of inhomogeneous Ni/Au/4H-SiC Schottky diodes, Mater. Sci Semicond. Process. 140 (2022) 106413.

Osvald, J. and Zaťko, B.: Anomalous intersection point of Schottky diodes I-V curves measured at different temperatures. In Proc. 10<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. M. Feiler et al. Žilina: EDIS 2022. ISBN 978-80-554-1884-1. P. 133-136.

Sedláčková, K., Zaťko, B., Šagátová, A., and Nečas, V.: Polarization effect of Schottky-barrier CdTe semiconductor detectors after electron irradiation, Nuclear Instr. Methods Phys. Res. A 1027 (2022) 166282.

Huran, J., Boháček, P., Sasinková, V., Kleinová, A., Mikolášek, M., and Kobzev, A.P.: Amorphous silicon carbide thin films doped with P or B for the photoelectrochemical water splitting devices, Current Applied Phys. 34 (2022) 101-106.

Huran, J., Sasinková, V., Nozdrin, M.A., Kováčová, E., Kobzev, A.P., and Kleinová, A.: Photo-induced electron emission of nanostructured carbon thin film based transmission photocathodes at different electric field, Adv. Electr. Electron. Engn. 20 (2022) 108-114.

Huran, J., Skrypnik, A.P., Sasinková, V., Doroshkevich, A.S., Nozdrin, M.A., Kováčová, E., and Shirkov, G.D.: Effect of electric field on the photoelectron emission properties of very thin carbon films prepared by electron beam-plasma vacuum deposition. In Proc. 10<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. M. Feiler et al. Žilina: EDIS 2022. ISBN 978-80-554-1884-1. P. 129-132.

**Programy: Iné projekty**

**40.) Štipendia pre excelentných výskumníkov ohrozených vojnovým konfliktom na Ukrajine**  
(*Scholarships for excellent researchers threatened by the war conflict in Ukraine*)

**Zodpovedný riešiteľ:** Tetiana Kalmykova  
**Trvanie projektu:** 1.4.2022 / 31.3.2025  
**Evidenčné číslo projektu:** 09I03-03-V01-00006  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** -

## Programy: Štrukturálne fondy EÚ Výskum a inovácie

### 41.) CEMEA - Vybudovanie centra pre využitie pokročilých materiálov SAV (*Building a centre for advanced material application SAS*)

**Zodpovedný riešiteľ:** Eva Majková  
**Zodpovedný riešiteľ v organizácii SAV:** Milan Ľapajna  
**Trvanie projektu:** 1.7.2019 / 30.6.2023  
**Evidenčné číslo projektu:** 313021T081  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** Centrum pre využitie pokročilých materiálov SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 6 - Slovensko: 6  
**Čerpané financie:** SAV: 47612 €

#### Dosiahnuté výsledky:

Vegso, K., Shaji, A., Sojková, M., Pribusová Slušná, L., Vojteková, T., Hrdá, J., Halahovets, Y., Hulman, M., Jergel, M., Majková, E., Wiesmann, J., and Šiffalovič, P.: A wide-angle X-ray scattering laboratory setup for tracking phase changes of thin films in a chemical vapor deposition chamber, *Rev. Sci Instrum.* 93 (2022) 113909.

Mustonen, K., Hofer, Ch., Kotrusz, P., , Markevich, A., Hulman, M., Mangler, C., Susi, T., Pennycook, T.J., Hricovini, K., Richter, Ch. M., Meyer, J.C., Kotakoski, J., and Skákalová, V.: Towards exotic layered materials: 2D cuprous iodide, *Adv. Mater.* 34 (2022) 2106922.

## Programy: DoktoGranty

### 42.) Optimalizácia rastu parametrov pre tenké vrstvy MoTe<sub>2</sub> (*Oprimisation of growth parameters for MoTe2*)

**Zodpovedný riešiteľ:** Tatiana Vojteková  
**Trvanie projektu:** 1.1.2022 / 31.12.2022  
**Evidenčné číslo projektu:** APP0282  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** SAV: 2000 €

#### Dosiahnuté výsledky:

Vojteková, T., Pribusová-Slušná, L., and Hulman, M.: Optical characterisation of MOTe<sub>2</sub> thin films. In *Proc. 10<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT*. Eds. M. Feiler et al. Žilina: EDIS 2022. ISBN 978-80-554-1884-1. P. 59-62.

## Programy: MoRePro

### 43.) Heteroštruktúry TMD/diamant: Príprava, charakterizácia a aplikácia (*TMD/diamond heterostructures: Fabrication, characterization and applications*)

**Zodpovedný riešiteľ:** Marian Varga  
**Trvanie projektu:** 1.8.2020 / 31.7.2024  
**Evidenčné číslo projektu:** 19MRP0010  
**Organizácia je** áno  
**koordinátorom projektu:**  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** SAV: 44448 €

#### Dosiahnuté výsledky:

Kromka, A., Babčenko, O., Izsák, T., Varga, M., Vanko, G., Zehetner, J., and Potocký, Š.: Growth of carbon allotropes in plasma CVD system. In Proc. 10<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. M. Feiler et al. Žilina: EDIS 2022. ISBN 978-80-554-1884-1. P. 17-20.

Cajzl, J., Nekvindová, P., Macková, A., Varga, M., and Kromka, A.: Erbium ion implantation into LiNbO<sub>3</sub>, Al<sub>2</sub>O<sub>3</sub>, ZnO and diamond – measurement and modelling – an overview, Phys. Chem. Chem. Phys. 24 (2022) 19052-19072.

## Programy: Európsky fond regionálneho rozvoja (EFRR)

### 44.) Nová technológia prípravy senzorov, detektorov a memristorov pre inteligentnú mikroelektroniku v 21. storočí (*New technology for the preparation of sensors, detectors and memristors for intelligent microelectronics in the 21st century*)

**Zodpovedný riešiteľ:** Vladimír Cambel  
**Trvanie projektu:** 1.3.2022 / 30.9.2023  
**Evidenčné číslo projektu:** ITMS2014+ 313011BVN5  
**Organizácia je** áno  
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**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
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**Príloha C****Publikačná činnosť organizácie (generovaná z ARL)****ADCA Vedecké práce v zahraničných karentovaných časopisoch – impaktovaných**

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2. [1.1] MOHAMMAD, E.J. - KAREEM, M.M. - LAFTA, A.J.A. Preparation of MWCNTS/Cr2O3-NiO Nanocomposite for Adsorption and Photocatalytic Removal of Bismarck Brown G Dye from Aqueous Solution. In INDONESIAN JOURNAL OF CHEMISTRY. ISSN 1411-9420, JUN 2020, vol. 20, no. 3, p. 554-566., Registrované v: WOS
3. [1.1] MONTAZER, E. - SHAFII, M.B. - SALAMI, E. - MUHAMAD, M.R. - YARMAND, H. - GHAREHKHANI, S. - CHOWDHURY, Z.Z. - KAZI, S.N. - BADARUDIN, A. Heat transfer in turbulent nanofluids: Separation flow studies and development of novel correlations. In ADVANCED POWDER TECHNOLOGY. ISSN 0921-8831, AUG 2020, vol. 31, no. 8, p. 3120-3133., Registrované v: WOS
4. [1.1] SHTAIWI, M.H. - TAHBOUB, D.M. - EL-SHEIKH, A.H. - AL-HASHIMI, N.N. Magnetic solid-phase extraction of metal ions: Comparison of adding Schiff base to the extraction medium vs. magnetite modification with Schiff base. In JOURNAL OF ENVIRONMENTAL CHEMICAL ENGINEERING. APR 2020, vol. 8, no. 2., Registrované v: WOS

AFC08

VALIK, L. - ĽAPAJNA, Milan - GUCMANN, Filip - FEDOR, Ján - ŠIFFALOVÍČ, Peter - FRÖHLICH, Karol. Distribution of fixed charge in MOS structures with ALD grown Al2O3 studied by capacitance measurements. In ASDAM 2012 : conference proceedings. Eds. Š. Haščík, J. Osvald. - Piscataway : IEEE, 2012, p. 227-230. ISBN 978-1-4673-1195-3.

**Citácie:**

1. [1.1] ZHAO, S. - YUAN, G.D. - ZHANG, D. - XU, P.F. - LI, G.Z. - HAN, W.H. Formation and elimination mechanism of thermal blistering in Al2O3/Si system. In JOURNAL OF MATERIALS SCIENCE. ISSN 0022-2461, NOV 2021, vol. 56, no. 31, p. 17478-17489., Registrované v: WOS

**AFD Publikované príspevky na domácich vedeckých konferenciách**

AFD01

OSVALD, Jozef. Interface electron traps and capacitance characteristics of AlGaIn/GaN. In APCOM 2012 : proceedings on Applied Physics of Condensed Matter of the 18th International Conference. Eds. J. Vajda, I. Jamnický. - Bratislava : Slovenská technická univerzita v Bratislave, 2012, p. 121-124. ISBN 978-80-227-3720-3.

**Citácie:**

1. [1.1] SONG, Y.L. - REDDY, M.K. - CHANG, L.M. - SHEU, G. Physics-Based TCAD Simulation and Calibration of 600 V GaN/AlGaIn/GaN Device Characteristics and Analysis of Interface Traps. In MICROMACHINES. JUL 2021, vol. 12, no. 7., Registrované v: WOS

AFD02

SEDLÁČKOVÁ, K. - ZÁTKO, Bohumír - ŠAGÁTOVÁ, A. - NEČAS, V. The effect of the LiF film topology on detection properties of thermal neutron semiconductor detectors. In APCOM 2017 : proceedings of the 23th International Conference on Applied Physics of Condensed Matter, June 12-14, 2017, Štrbské Pleso, Slovak Republic. Eds. J. Vajda and I. Jamnický. - Bratislava : SPEKTRUM STU, 2017, p. 125-129. ISBN 978-80-227-4699-1.

**Citácie:**

1. [1.1] BERNAT, R. - BAKRAC, L. - RADULOVIC, V. - SNOJ, L. - MAKINO, T. -

*OHSHIMA, T. - PASTUOVIC, Z. - CAPAN, I. 4H-SiC Schottky Barrier Diodes for Efficient Thermal Neutron Detection. In MATERIALS. SEP 2021, vol. 14, no. 17., Registrované v: WOS*

- AFD03 ŤAPAJNA, Milan - VINCZE, A. - NOGA, Pavol - DOBROVODSKÝ, Jozef - ŠAGÁTOVÁ, A. - HASENÖHRL, Stanislav - GREGUŠOVÁ, Dagmar - KUZMÍK, Ján. Determination of secondary-ions yield in SIMS depth profiling of Si, Mg, and C ions implanted GaN epitaxial layers. In ASDAM 2018 : The Twelfth International Conference on Advanced Semiconductor Devices and Microsystems. Editors: J. Breza, D. Donoval, E. Vavrinsky. - IEEE, 2018, p. 141-144. ISBN 978-1-5386-7488-8. Dostupné na: <https://doi.org/10.1109/ASDAM.2018.8544657> (VEGA 2/0012/18)

Citácie:

*1. [1.1] HAJEK, F. - HOSPODKOVA, A. - HUBACEK, T. - OSWALD, J. - PANGRAC, J. - DOMINEC, F. - HORESOVSKY, R. - KULDOVA, K. Depth profile of acceptor concentration in InGaN/GaN multiple quantum wells. In JOURNAL OF LUMINESCENCE. ISSN 0022-2313, AUG 2021, vol. 236., Registrované v: WOS*

#### AFK Postery zo zahraničných konferencií

- AFK01 SOLOVYOV, Mykola - GÖMÖRY, Fedor - ŠOUC, Ján - MIKULÁŠOVÁ, Edita - UŠÁKOVÁ, M. - UŠÁK, E. Force acting on a magnetic cloak placed in magnetic field (EUCAS 2017)

Citácie:

*1. [1.1] ALEKSEEV, G.V. - SPIVAK, Y.E. Optimization-Based Numerical Analysis of Three-Dimensional Magnetic Cloaking Problems. In COMPUTATIONAL MATHEMATICS AND MATHEMATICAL PHYSICS. ISSN 0965-5425, FEB 2021, vol. 61, no. 2, p. 212-225., Registrované v: WOS*

- AFK02 STAINES, M. - YAZDANI ASRAMIA, M. - GLASSON, N. - ALLPRESS, N. - JOLLIFFE, L. - PARDO, Enric. Cooling systems for HTS transformers: impact of cost, overload, and fault current performance expectations (European Cryogenics Days 2017 and the 2nd International Workshop on Cooling Systems for HTS Applications (IWC-HTS) : Karlsruhe 2017)

Citácie:

*1. [1.1] SONG, W.J. - PEI, X.Z. - XI, J.W. - ZENG, X.W. A Novel Helical Superconducting Fault Current Limiter for Electric Propulsion Aircraft. In IEEE TRANSACTIONS ON TRANSPORTATION ELECTRIFICATION. ISSN 2332-7782, MAR 2021, vol. 7, no. 1, p. 276-286., Registrované v: WOS*

#### GII Rôzne publikácie a dokumenty, ktoré nemožno zaradiť do žiadnej z predchádzajúcich kategórií

- GII01 AINSLIE, M.D.\*\* - GRILLI, F. - QUEVAL, L. - PARDO, Enric - PEREZ-MENDEZ, F. - MATAIRA, R. - MORANDI, A. - GHABELI, Asef - BUMBY, C. - BRAMBILLA, R. A new benchmark problem for electromagnetic modelling of superconductors: the high-Tc superconducting dynamo (2020 Supercond. Sci. Technol. 33 105009) : Corrigendum. In Superconductor Science and Technology, 2021, vol. 34, no. 029502. (2020: 3.219 - IF, Q2 - JCR, 1.033 - SJR, Q1 - SJR, karentované - CCC). (2021 - Current Contents). ISSN 0953-2048. Dostupné na: <https://doi.org/10.1088/1361-6668/abd522>

Citácie:

*1. [1.1] PRIGOZHIN, L. - SOKOLOVSKY, V. Fast solution of the superconducting dynamo*

*benchmark problem. In SUPERCONDUCTOR SCIENCE & TECHNOLOGY. ISSN 0953-2048, JUN 2021, vol. 34, no. 6., Registrované v: WOS*

## **Príloha D**

### **Údaje o pedagogickej činnosti organizácie**

#### Semestrálne prednášky:

doc. Ing. Fedor Gömöry, DrSc.

Názov semestr. predmetu: Elektromagnetické prvky a systémy

Počet hodín za semester: 4

Názov katedry a vysokej školy: Fakulta elektrotechniky a informatiky STU, Ústav elektrotechniky

Ing. Ján Šoltýs, PhD

Názov semestr. predmetu: Nanotechnológie

Počet hodín za semester: 4

Názov katedry a vysokej školy: Fakulta elektrotechniky a informatiky STU, ÚJFI

#### Semestrálne cvičenia:

Ing. Lubomír Frolek

Názov semestr. predmetu: Elektromagnetické prvky a systémy

Počet hodín za semester: 4

Názov katedry a vysokej školy: Fakulta elektrotechniky a informatiky STU, Ústav elektrotechniky

RNDr. Dagmar Gregušová, DrSc.

Názov semestr. predmetu: Praktikum Fyziky tuhých látok

Počet hodín za semester: 20

Názov katedry a vysokej školy: Fakulta matematiky, fyziky a informatiky UK, Katedra experimentálnej fyziky

Ing. Tomáš Kujovič, PhD.

Názov semestr. predmetu: Elektromagnetické prvky a systémy

Počet hodín za semester: 4

Názov katedry a vysokej školy: Fakulta elektrotechniky a informatiky STU, Ústav elektrotechniky

Ing. Marek Mošat', PhD.

Názov semestr. predmetu: Elektromagnetické prvky a systémy

Počet hodín za semester: 4

Názov katedry a vysokej školy: Fakulta elektrotechniky a informatiky STU, Ústav elektrotechniky

Mgr. Mykola Soloviov, PhD.

Názov semestr. predmetu: Elektromagnetické prvky a systémy

Počet hodín za semester: 4

Názov katedry a vysokej školy: Fakulta elektrotechniky a informatiky STU, Ústav elektrotechniky

Ing. Ján Šoltýs, PhD

Názov semestr. predmetu: Nanotechnológie

Počet hodín za semester: 4

Názov katedry a vysokej školy: Fakulta elektrotechniky a informatiky STU, ÚJFI



**Príloha E****Medzinárodná mobilita organizácie****(A) Vyslanie vedeckých pracovníkov do zahraničia na základe dohôd:**

| Krajina    | D r u h d o h o d y |           |                 |           |                              |           |
|------------|---------------------|-----------|-----------------|-----------|------------------------------|-----------|
|            | MAD, KD, VTS        |           | Medziústavná    |           | Ostatné                      |           |
|            | Meno pracovníka     | Počet dní | Meno pracovníka | Počet dní | Meno pracovníka              | Počet dní |
| Bulharsko  |                     |           |                 |           | Milan<br>Ťapajna             | 3         |
| Česko      |                     |           |                 |           | Martin<br>Hulman             | 1         |
|            |                     |           |                 |           | Tibor Izsák                  | 5         |
|            |                     |           |                 |           | Lenka<br>Pribusová<br>Slušná | 2         |
|            |                     |           |                 |           | Viera<br>Skákalová           | 3         |
|            |                     |           |                 |           | Ján Šoltýs                   | 1         |
|            |                     |           |                 |           | Jaroslav<br>Tóbik            | 1         |
|            |                     |           |                 |           | Gabriel<br>Vanko             | 5         |
|            |                     |           |                 |           | Marian<br>Varga              | 9         |
|            |                     |           |                 |           | Marian<br>Varga              | 10        |
|            |                     |           |                 |           | Marian<br>Varga              | 6         |
|            |                     |           |                 |           | Tatiana<br>Vojteková         | 2         |
|            |                     |           |                 |           | Bohumír<br>Zaťko             | 3         |
|            |                     |           |                 |           | Bohumír<br>Zaťko             | 4         |
| Dánsko     |                     |           |                 |           | Boris Hudec                  | 5         |
|            |                     |           |                 |           | Marián<br>Precner            | 5         |
| Francúzsko |                     |           |                 |           | Anang<br>Dadhich             | 3         |
|            |                     |           |                 |           | Michal<br>Mruczkiewicz       | 2         |
|            |                     |           |                 |           | Enric Pardo                  | 3         |
|            |                     |           |                 |           | Viera<br>Skákalová           | 5         |
|            |                     |           |                 |           | Arpit Kumar<br>Srivastava    | 3         |
| Holandsko  |                     |           |                 |           | Eugen Seiler                 | 9         |
| Nemecko    |                     |           |                 |           | Fedor                        | 3         |

|             |                   |   |  |  |                             |    |
|-------------|-------------------|---|--|--|-----------------------------|----|
|             |                   |   |  |  | Gömöry                      |    |
|             |                   |   |  |  | Fedor<br>Gömöry             | 7  |
|             |                   |   |  |  | Fedor<br>Gömöry             | 6  |
|             |                   |   |  |  | Boris Hudec                 | 3  |
|             |                   |   |  |  | Pavol Kováč                 | 7  |
|             |                   |   |  |  | Tomáš<br>Kujovič            | 3  |
|             |                   |   |  |  | Tomáš<br>Kujovič            | 6  |
|             |                   |   |  |  | Marek<br>Mošať              | 3  |
|             |                   |   |  |  | Marek<br>Mošať              | 6  |
|             |                   |   |  |  | Enric Pardo                 | 1  |
|             |                   |   |  |  | Rastislav<br>Ries           | 3  |
|             |                   |   |  |  | Arpit Kumar<br>Srivastava   | 1  |
| Nórsko      |                   |   |  |  | Peter Hutár                 | 15 |
| Poľsko      | Štefan<br>Chromik | 5 |  |  | Michał<br>Mruczkiewicz<br>z | 13 |
|             |                   |   |  |  | Michał<br>Mruczkiewicz<br>z | 11 |
| Rakúsko     |                   |   |  |  | Martin<br>Hulman            | 3  |
|             |                   |   |  |  | Tibor Izsák                 | 5  |
|             |                   |   |  |  | Michaela<br>Sojková         | 5  |
|             |                   |   |  |  | Gabriel<br>Vanko            | 5  |
|             |                   |   |  |  | Tatiana<br>Vojteková        | 3  |
| Srbsko      |                   |   |  |  | Martin<br>Hulman            | 2  |
| Švajčiarsko |                   |   |  |  | Fedor<br>Gömöry             | 5  |
|             |                   |   |  |  | Arif Hussain                | 6  |
|             |                   |   |  |  | Michał<br>Mruczkiewicz<br>z | 5  |
|             |                   |   |  |  | Eugen Seiler                | 6  |
| Taliansko   |                   |   |  |  | Jana Hrdá                   | 4  |
|             |                   |   |  |  | Jana Hrdá                   | 4  |
|             |                   |   |  |  | Martin<br>Hulman            | 5  |
|             |                   |   |  |  | Martin<br>Hulman            | 3  |

|                            |          |          |  |  |                   |            |
|----------------------------|----------|----------|--|--|-------------------|------------|
|                            |          |          |  |  | Martin Hulman     | 10         |
|                            |          |          |  |  | Štefan Chromik    | 3          |
|                            |          |          |  |  | Peter Kotrusz     | 9          |
|                            |          |          |  |  | Peter Nádaždy     | 10         |
|                            |          |          |  |  | Viera Skákalová   | 9          |
|                            |          |          |  |  | Michaela Sojková  | 5          |
|                            |          |          |  |  | Michaela Sojková  | 4          |
|                            |          |          |  |  | Marianna Španková | 3          |
|                            |          |          |  |  | Tatiana Vojteková | 4          |
| USA                        |          |          |  |  | Ján Fedor         | 30         |
| <b>Počet vyslaní spolu</b> | <b>1</b> | <b>5</b> |  |  | <b>61</b>         | <b>326</b> |

**(B) Prijatie vedeckých pracovníkov zo zahraničia na základe dohôd:**

| Krajina                    | D r u h d o h o d y |           |                 |           |                 |           |
|----------------------------|---------------------|-----------|-----------------|-----------|-----------------|-----------|
|                            | MAD, KD, VTS        |           | Medziústavná    |           | Ostatné         |           |
|                            | Meno pracovníka     | Počet dní | Meno pracovníka | Počet dní | Meno pracovníka | Počet dní |
| Nemecko                    |                     |           |                 |           | Winkler T.      | 3         |
| Poľsko                     | Gierlowski P.       | 6         |                 |           |                 |           |
|                            | Zajcewa I.          | 6         |                 |           |                 |           |
| Rakúsko                    |                     |           |                 |           | Zaoli Z.        | 2         |
| Srbsko                     |                     |           |                 |           | Damnjanovic M.  | 2         |
| <b>Počet prijatí spolu</b> | <b>2</b>            | <b>12</b> |                 |           | <b>3</b>        | <b>7</b>  |

**(C) Účast' pracovníkov pracoviska na konferenciách v zahraničí (nezahrnutých v "A"):**

| Krajina           | Názov konferencie     | Meno pracovníka  | Počet dní |
|-------------------|-----------------------|------------------|-----------|
| Belgicko          | ALD 2022              | Boris Hudec      | 4         |
| Česko             | NANOCON 2022          | Tibor Izsák      | 4         |
|                   |                       | Marian Varga     | 4         |
| Dánsko            | MDE                   | Ondrej Pohorelec | 4         |
| Francúzsko        | IWED 2022             | Viera Skákalová  | 5         |
| Japonsko          | TWHM 2022             | Ján Kuzmík       | 10        |
| Japonsko (online) | ISS 2022              | Anang Dadhich    | 2         |
|                   |                       | Enric Pardo      | 2         |
|                   | TTC2022 Meeting       | Rastislav Ries   | 3         |
| Nemecko           | GW                    | Michaela Sojková | 6         |
|                   | HTS4Fusion & MEM 2022 | Marek Búran      | 7         |

|                   |   |                        |            |
|-------------------|---|------------------------|------------|
|                   |   | Fedor Gömöry           | 7          |
|                   |   | Pavol Kováč            | 7          |
|                   |   | Rastislav Ries         | 7          |
|                   |   | Mykola Soloviov        | 7          |
|                   | IWN 2022                                  | Michal Blaho           | 6          |
|                   |   | Dagmar Gregušová       | 6          |
|                   |   | Ján Kuzmík             | 6          |
|                   |   | Ondrej Pohorelec       | 6          |
|                   |   | Peter Šichman          | 6          |
| Poľsko            | e-MRS                                     | Filip Gucmann          | 5          |
|                   |   | Roman Stoklas          | 5          |
|                   |   | Milan Ťapajna          | 5          |
|                   |   | Gabriel Vanko          | 5          |
|                   | e-MRS 2022                                | Jana Hrdá              | 5          |
|                   | IEEE NAP 2022                             | Juraj Feilhauer        | 6          |
|                   | JEMS 2022                                 | Iuliia Vetrova         | 6          |
| Portugalsko       | IASM                                      | Konstantin Bublikov    | 5          |
|                   | WOCSDICE                                  | Filip Gucmann          | 6          |
|                   |   | Jozef Novák            | 6          |
| Španielsko        | NANO 2022                                 | Viera Skákalová        | 5          |
|                   | SSM                                       | Ján Šoltýs             | 5          |
| Švajčiarsko       | EWEG                                      | Martin Hulman          | 5          |
|                   |   | Lenka Pribusová Slušná | 5          |
|                   |   | Tatiana Vojteková      | 5          |
| Taliansko         | CIMTEC 2022                               | Fedor Gömöry           | 5          |
|                   | IEEE NSS                                  | Bohumír Zaťko          | 7          |
|                   | iWoRiD                                    | Norbert Gál            | 6          |
|                   |   | Bohumír Zaťko          | 6          |
| Ukrajina (online) | In IEEE 2nd Ukrainian Microwave Week 2022 | Tetiana Kalmykova      | 2          |
| USA               | ASC 2022                                  | Anang Dadhich          | 11         |
|                   |   | Fedor Gömöry           | 11         |
|                   |   | Tomáš Kujovič          | 11         |
|                   |   | Marek Mošat'           | 11         |
|                   |   | Rastislav Ries         | 11         |
| Veľká Británia    | EFATS                                     | Enric Pardo            | 2          |
| <b>Spolu</b>      | <b>25</b>                                 | <b>46</b>              | <b>271</b> |

Vysvetlivky: MAD - medziakademické dohody, KD - kultúrne dohody, VTS - vedecko-technická spolupráca v rámci vládnych dohôd

#### Skratky použité v tabuľke C:

ALD 2022 - 22st International Conference on Atomic Layer Deposition

ASC 2022 - Applied Superconductivity Conference 2022

CIMTEC 2022 - 15th International Conference on Modern Materials and Technologies

e-MRS - 20th E-MRS Fall Meeting 2022

e-MRS 2022 - 20th E-MRS Fall Meeting 2022

EFATS - 2nd International Conference on Emissions Free Air Transport through Superconductivity

EWEG - 5th European Workshop on Epitaxial Graphene and 2D Materials

GW - Graphene Week 2022

HTS4Fusion & MEM 2022 - 5th HTS4Fusion Conductor Workshop & 10th MEM Mechanical & Electromagnetic Properties of Composite Superconductors

IASM - 4th International Advanced School on Magnonics  
IEEE NAP 2022 - IEEE 12th International Conference "Nanomaterials: Applications & Properties  
IEEE NSS - 2022 IEEE Nuclear Science Symposium, Medical Imaging Conference and Room Temperature Semiconductor Detector  
In IEEE 2nd Ukrainian Microwave Week 2022 - UMW 2022  
ISS 2022 - 35th International Symposium on Superconductivity  
IWED 2022 - 5th International Workshop on Electron Dynamics  
IWN 2022 - International Workshop on Nitride Semiconductors  
iWoRiD - 23rd International Workshop on Radiation Imaging Detectors  
JEMS 2022 - Joint European Magnetic Symposia  
MDE - Modern directions in Epitaxy  
NANO 2022 - 16th International Conference on Nanostructured Materials  
NANOCON 2022 - 14th International Conference on Nanomaterials  
SSM - Sol-SkyMag 2022  
TTC2022 Meeting - Tesla Technology Collaboration  
TWHM 2022 - 14th Topical Workshop on Heterostructure Microelectronics  
WOCSDice - 45th Workshop on Compound Semiconductor Devices and Integrated Circuits



**Príloha F****Vedecko-popularizačná činnosť pracovníkov organizácie SAV**

| <b>Meno</b>                    | <b>Spoluautori</b>  | <b>Typ<sup>1</sup></b> | <b>Názov</b>   | <b>Miesto zverejnenia</b>    | <b>Dátum alebo počet za rok</b> |
|--------------------------------|---|------------------------|--|------------------------------|---------------------------------|
| Mgr. Fridrich Egyenes          |   | TL                     | Kyseliny v kuchyni   | Quark                        | 26.3.2022                       |
| doc. Ing. Fedor Gömöry, DrSc.  |   | IN                     | Podľa vedca zo SAV nie sú reaktory na jadrovú fúziu len ďalšia technologická kuriozita. Môžu kompletne zmeniť budúcnosť energetiky | Refresher (webový portál)    | 18.3.2022                       |
| doc. Ing. Fedor Gömöry, DrSc.  |   | TL                     | Vedci dosiahli prelom v jadrovej fúzii   | SME                          | 27.1.2022                       |
| doc. Ing. Fedor Gömöry, DrSc.  |   | TL                     | Veľký krok vpred. Pri fúznej reakcii vyrobili rekordné množstvo energie  | DenníkN                      | 11.2.2022                       |
| Ing. Filip Gučmann, PhD.       | M. Španková, D. Gregušová, T. Kujovič, M. Mošat', L. Frolek | iné                    | Európska noc výskumníkov   | Stará tržnica, Bratislava    | 2022                            |
| Ing. Filip Gučmann, PhD.       | O. Pohorelec  | IN                     | Reklamná kampaň "nové PhD témy na EIÚ SAV"   | Facebook a Instagram EIÚ SAV | 2022                            |
| Ing. Filip Gučmann, PhD.       | O. Pohorelec, F. Egyenes                                    | iné                    | Prezentačný stánok v rámci kariérneho veľtrhu Dni príležitostí   | FEI STU                      | 2022                            |
| RNDr. Katarína Neilinger, PhD. |   | PB                     | Je veda riešením na všetko?  | ESET Science Award           | 2022                            |
| Mgr. Bohumír Zafko, PhD        |   | TV                     | Inovatívny detektor ionizovaného žiarenia  | VAT na STV2                  | 19.2.2022                       |

<sup>1</sup> PB - prednáška/beseda, TL - tlač, TV - televízia, RO - rozhlas, IN - internet, EX - exkurzia, PU - publikácia, MM - multimédiá, DO - dokumentárny film