

**Ústav stavebníctva a architektúry SAV, v. v. i.**



**Výročná správa o činnosti a hospodárení verejnej výskumnej  
inštitúcie za rok 2022**

Bratislava  
júl 2023

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*Správa o činnosti organizácie SAV za rok 2022*

## 1. Základné údaje o verejnej výskumnej inštitúcii

**Názov:** Ústav stavebníctva a architektúry SAV, verejná výskumná inštitúcia  
**Riaditeľ:** prof. Dr. Ing. Martin Tchingnabé Palou  
**Zástupca riaditeľa:** Ing. Peter Matiašovský, CSc.  
**Adresa:** Dúbravská cesta 5813/9, 845 03 Bratislava – Karlova Ves  
**Tel.:** 02/54773548  
**E-mail:** [usarstav@savba.sk](mailto:usarstav@savba.sk)

## **2. Zmeny zakladacej listiny, vnútorných predpisov verejnej výskumnej inštitúcie alebo vnútorných predpisov zakladateľa**

Ústav stavebníctva a architektúry SAV, v. v. i. sa stal s účinnosťou od 1.1.2022 verejnou výskumnou inštitúciou na základe zakladacej listiny č. 06160/2021 zo dňa 15. 11. 2021 vydanéj Slovenskou akadémiou vied podľa § 3 ods. 1 písm. b) zákona č. 243/2017 Z. z. o verejnej výskumnej inštitúcii a o zmene a doplnení niektorých zákonov a § 21aa ods. 1 a 7 písm. a) zákona č. 133/2002 Z. z. o Slovenskej akadémii vied. Dodatkom č. 1 vydaným 11. 2. 2022 sa upravila adresa sídla verejnej výskumnej inštitúcie.

Základné vnútorné predpisy organizácie zahrňujúce:

- Organizačný poriadok
- Pracovný poriadok
- Pravidlá tvorby rozpočtu
- Štatút
- Volebný a nominačný poriadok na funkciu člena Vedeckej rady
- Volebný a nominačný poriadok na funkciu člena Správnej rady
- Pravidlá hodnotenia výskumných pracovníkov

predložila Správna rada ústavu predsedovi Dozornej a Vedeckej rady dňa 14. 2. 2022. Vedecká rada sa súhlasne vyjadrila k týmto vnútorným predpisom dňa 23. 2. 2023. Dozorná rada sa súhlasne vyjadrila k týmto vnútorným predpisom dňa 2. 3. 2023. Na základe súhlasných vyjadrení Správna rada schválila tieto vnútorné predpisy dňa 10. 3. 2023.

### 3. Zloženie orgánov, zmeny v ich zložení a ich činnosť

#### Správna rada

Predseda:	prof. Dr. Ing. Martin- Tchingnabé Palou
Podpredsedníčka:	Mgr. Renata Miklošová
Členovia:	doc. Ing. Miroslav Čekon, PhD. RNDr. Ladislav Kómar, PhD. Ing. Miroslav Repka, PhD.

Správna rada ústavu zasadala 7x v roku 2022; a to 27. 1. 2022, 10. 3. 2022, 29. 3. 2022, 2. 5. 2022, 20. 9. 2022, 4. 11. 2022 a 6. 12. 2022. Na svojich zasadnutiach volila podpredsedu Správnej rady, schvaľovala Rokovací poriadok Správnej rady, vnútorné predpisy organizácie, rozpočet na rok 2022, tvorbu rezervného fondu v roku 2022, prerokovávala výsledky hospodárenia za rok 2021, Kolektívnu zmluvu ústavu so zástupcom zamestnancov, výsledky vnútorného auditu ústavu za roky 2018 – 2021, vyhlasovala a organizovala voľby do Vedeckej rady ústavu, pripravovala podklady k akreditácii ústavu a vyjadrovala sa k Návrhom na vydanie Rozhodnutí o dočasnej nepotrebnosti nehnuteľného majetku ústavu za účelom prenájmu.

#### Vedecká rada

Predseda:	Mgr. Miroslav Kocifaj, DrSc.
Interní členovia:	Ing. Eva Kuzielová, PhD. Ing. Ladislav Sátor, PhD.
Externí členovia:	Ing. Martin Dovál, PhD. prof. Mgr. Ivan Martinček, PhD.

Vedecká rada ústavu zasadala 6x v roku 2022; a to 20. 1. 2022, 15. 2. 2022, 4. 5. 2022, 8.6. 2022, 10.10. 2022, a 9.11.2022. Na svojich zasadnutiach prerokovávala najvýznamnejšie výsledky vedeckej práce za rok 2021, Správu o činnosti ústavu za rok 2021, návrh metódy hodnotenia vedeckých výstupov, metódy výberu najvýznamnejších výsledkov ústavu, spôsob zasadnutí Vedeckej rady a volila predsedu Vedeckej rady.

Do 31. 12. 2022 bola internou členkou Vedeckej rady ústavu Ing. Eva Kuzielová, PhD. Po skončení jej pracovného pomeru ku dňu 31. 12. 2022 zanikla jej funkcia ako internej členky Vedeckej rady. Dňa 16. 2. 2023 bol v doplňujúcich voľbách na interného člena Vedeckej rady ústavu zvolený Mgr. Jaromír Petržala, PhD.

#### Dozorná rada

Predseda:	Ing. Ivana Budinská, PhD.
Členovia:	Ing. Romana Jurkiewiczová prof. Ing. Dušan Petráš, PhD.

Dozorná rada ústavu zasadala 6x v roku 2022; a to 2. 2. 2022, 11. 2. 2022, 23. 2. 2022, 6. 4. 2022, 16. 6. 2022 a 21. 11. 2022. Na svojich zasadnutiach volila predsedu Dozornej rady, schvaľovala vnútorné predpisy organizácie s pripomienkami na zapracovanie a vyjadrovala sa k Návrhom na vydanie Rozhodnutí o dočasnej nepotrebnosti nehnuteľného majetku ústavu za účelom prenájmu a k Návrhom na uzavretie Zmlúv o nájme nebytových priestorov.

#### **4. Prehľad výsledkov dosiahnutých v r. 2022**

Výsledky dosiahnuté v r. 2022 sú uvedené v Správe o činnosti organizácie SAV za rok 2022 (Príloha)

## 5. Hodnotenie výsledkov výskumnej činnosti verejnej výskumnej inštitúcie a jej spôsobilosti vykonávať výskumnú činnosť vedeckou radou

Výsledky výskumnej činnosti inštitúcie pokrývajú rozmanité oblasti zodpovedajúce heterogenite jej výskumného zamerania. Hlavnými vedeckými disciplínami sú aplikovaná mechanika, stavebné inžinierstvo a konštrukcie, optika a termofyzika. Sú rozvíjané na troch vedeckých oddeleniach: oddelení mechaniky, oddelení materiálov a konštrukcií, oddelení optiky a termofyziky.

Oddelenie mechaniky sa špecializuje na multifyzikálne matematické modelovanie mikro/nano konštrukcií využívaných v MEMS a NEMS zariadeniach. Ďalšou oblasťou je vývoj pokročilých numerických metód potrebných pre riešenie úloh z oblasti mikro/nano mechaniky. Oddelenie sa zaoberá takisto multifyzikálnym a multiškálovým počítačovým modelovaním inžinierskych konštrukcií s funkčnými vlastnosťami materiálov. Sú to napr. kompozitné dosky tvorené funkčne gradovanými materiálmi v interakcii s rôznymi fyzikálnymi poľami, napríklad elektrickým, teplotným. Ďalším smerom výskumu na tomto oddelení je multiškálová flexoelektrická / flexomagnetická teória a hľadanie metódy na detekciu mikrotrhlín v dielektrikách v reálnom čase, čo môže nájsť uplatnenie mikro/nanoelektronike. Mikro- a nanokonštrukciami sa zaoberá aj ďalší smer výskumu, konkrétne ide optimalizáciu dizajnu takýchto konštrukcií používaných pri výrobe metamateriálov.

Oddelenie optiky a termofyziky sa v oblasti optiky zameriava na výskum svetelných emisií miest a globálnu charakterizáciu difúzneho jasu nočnej oblohy, pričom vyvíja efektívne matematické metódy modelovania, ktorých cieľom je predpovedať zmeny v úrovniach svetelného znečistenia v závislosti na charaktere lokality a použitej svetelnej technológii. Vystavenie nočnému osvetleniu je spojené s negatívnymi environmentálnymi dopadmi pochádzajúcimi z mestských oblastí. Preto na tento globálny fenomén nemožno zabúdať pri procesoch plánovania miest, aby sa znížili potenciálne škodlivé vplyvy na prostredie a ľudí. Okrem toho sa oddelenie venuje aj vývoju fyzikálnych modelov jasu dennej oblohy, ktoré tvoria dôležitý vstup pri odhadoch úrovne denného svetla v budovách či vo fotovoltaike. Ostatným smerom je výskum energetickej účinnosti inovatívnych vstavaných fotovoltaických panelov chladených PCM technológiou.

Primárny výskum na Oddelení stavebných materiálov a konštrukcií sa zameriava na štúdium chémie, mechanizmu a kinetiky hydratačných reakcií, vrátane karbonatácie, hydraulických spojív za normálnych, ako aj hydrotermálnych podmienok ošetrovania. Detailná znalosť týchto procesov je využívaná aj pre návrhy materiálov vhodných na ukladanie oxidu uhličitého. Následný aplikačný výskum je orientovaný na vývoj pokročilých anorganických spojív založených na systéme viacložkových cementov vhodných pre použitie v mimoriadne náročných podmienkach. Ide o cementové tmely a pasty dimenzované pre prostredia geotermálnych vrtov a ropného priemyslu. Vytvárané zmesi vysokohodnotných ťažkých betónov a samozhutňujúcich sa ťažkých mált vystužených vláknami sú prednostne určené pre aplikácie v prostrediach vystavených ionizujúcemu žiareniu.

Prehľad konkrétnych najvýznamnejších výsledkov z jednotlivých oddelení na báze základného výskumu aj aplikačného typu je uvedený v Správe o činnosti organizácie SAV za rok 2022 (Príloha). Tieto práce sú publikované v kvalitných renomovaných vedeckých časopisoch a majú tak potenciál byť prínosom v príslušných vedných oblastiach.

Celkovo boli výsledky výskumu publikované v 37 vedeckých prácach registrovaných v Current

Contents Connect a 5 prácach registrovaných vo Web of Science Core Collection alebo Scopus. Väčšina z nich v časopisoch nachádzajúcich sa v kvartile Q1 prípadne Q2. To aj pri relatívne malom počte vedeckých pracovníkov inštitúcie svedčí o jej spôsobilosti vykonávať kvalitnú výskumnú činnosť. Dokladom toho je tiež 12 národných projektov riešených v danom roku.



## **6. Ročná účtovná závierka**

Ročná účtovná závierka

- a) bola predložená na prerokovanie správnej rade dňa 24. 3. 2023 a správna rada sa vyjadrila dňa 27. 3. 2023,
- b) bola predložená na schválenie dozornej rade dňa 28. 3. 2023 a dozorná rada ju schválila dňa 4. 4. 2023.

Ročná účtovná závierka bola uložená do registra účtovných závierok dňa 13. 4. 2023.

**7. Výrok štatutárneho audítora k ročnej účtovnej závierke, ak sa k ročnej účtovnej závierke za príslušný rok vyhotovuje správa audítora**

K ročnej účtovnej závierke za rok 2022 nebola vyhotovená správa audítora.

## 8. Prehľad príjmov a výdavkov

Prehľad príjmov a výdavkov z:

Príjem

Výdavok

		Príjem	Výdavok
1.	z hlavnej činnosti okrem druhého a tretieho bodu	1 344 846,72 eur	1 322 607,02 eur
2.	činnosti podľa § 2 ods. 1 písm. a)		
3.	činnosti podľa § 2 ods. 1 písm. b)		
4.	činnosti podľa § 2 ods. 1 písm. c)		
5.	činnosti podľa § 2 ods. 1 písm. d)		
6.	činnosti podľa § 2 ods. 1 písm. e)		

## 9. Pohyb a konečný stav majetku

Počiatkový stav majetku k 1.1.2022	Pohyb majetku	Konečný stav majetku k 31.12.2022
2 548 256,19	148 258,30	2 696 514,49

## **10. Opatrenia prijatých na odstránenie nedostatkov v hospodárení a správu o plnení opatrení prijatých na odstránenie nedostatkov**

Neboli identifikované žiadne nedostatky v hospodárení a preto nebolo potrebné prijať nápravné opatrenia.

## 11. Další údaje

**Výročnú správu o činnosti a hospodárení verejnej výskumnej inštitúcie za rok 2022 spracoval(i):**

prof. Dr. Ing. Martin Tchingnabé Palou  
Mgr. Renata Miklošová  
Ing. Miroslav Kocifaj, DrSc.  
Mgr. Iveta Mikušiaaková

**Stanovisko správnej rady**

Správna rada ÚSTARCH SAV, v. v. i. na svojom zasadnutí dňa 20.07.2023 odsúhlasila predloženú Výročnú správu o činnosti a hospodárení verejnej výskumnej inštitúcie za rok 2022.

**Stanovisko vedeckej rady**

Vedecká rada ÚSTARCH SAV, v. v. i. dňa 17.07.2023 per rollam odsúhlasila predloženú Výročnú správu o činnosti a hospodárení verejnej výskumnej inštitúcie za rok 2022.

**Stanovisko dozornej rady**

Dozorná rada ÚSTARCH SAV, v. v. i. prerokovala dňa 05.06.2023 per rollam predložené znenie Výročnej správy organizácie za rok 2022 a nemá pripomienky.

V Bratislave 20.07.2023

.....  
prof. Dr. Ing. Martin-Tchingnabé Palou  
riaditeľ Ústav stavebníctva a architektúry SAV, v. v. i.

**Ústav stavebníctva a architektúry SAV, v. v. i.**



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

Bratislava  
január 2023



## **Obsah**

1. Základné údaje o organizácii
2. Vedecká činnosť
3. Doktorandské štúdium, iná pedagogická činnosť a budovanie ľudských zdrojov pre vedu a techniku
4. Medzinárodná vedecká spolupráca
5. Koncepcia dlhodobého rozvoja organizácie
6. Spolupráca s VŠ a inými subjektmi v oblasti vedy a techniky
7. Aplikácia výsledkov výskumu v spoločenskej a hospodárskej praxi
8. Aktivity pre Národnú radu SR, vládu SR, ústredné orgány štátnej správy SR a iné org.
9. Vedecko-organizačné a popularizačné aktivity
10. Činnosť knižnično-informačného pracoviska
11. Aktivity v orgánoch SAV
12. Hospodárenie organizácie
13. Nadácie a fondy pri organizácii SAV
14. Informácie o aktivitách súvisiacich s uplatňovaním princípov rodovej rovnosti
15. Iné významné činnosti organizácie SAV
16. Vyznamenania, ocenenia a ceny udelené organizácii a pracovníkom organizácie SAV
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## ***PRÍLOHY***

- A Zoznam zamestnancov a doktorandov organizácie k 31.12.2022*
- B Projekty riešené v organizácii*
- C Publikáčná činnosť organizácie*
- D Údaje o pedagogickej činnosti organizácie*
- E Medzinárodná mobilita organizácie*
- F Vedecko-popularizačná činnosť pracovníkov organizácie SAV*

## 1. Základné údaje o organizácii

### 1.1. Kontaktné údaje

**Názov:** Ústav stavebníctva a architektúry SAV, v. v. i.  
**Riaditeľ:** Prof.Dr.Ing. Martin-Tchingnabé Palou  
**Zástupca riaditeľa:** Ing. Peter Matiašovský, CSc.  
**Vedecký tajomník:** RNDr. Ladislav Kómar, PhD.  
**Predseda vedeckej rady:** Mgr. Miroslav Kocifaj, DrSc.  
**Člen Snemu SAV:** Ing. Miroslav Repka, PhD.  
**Adresa:** Dúbravská cesta 9, 845 03 Bratislava 45

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

**Tel.:** 02/ 5477 3548

**E-mail:** [usarstav@savba.sk](mailto:usarstav@savba.sk)

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

Organizačné zložky: nie sú

Detašované pracoviská: nie sú

### Vedúci organizačných zložiek a detašovaných pracovísk:

Organizačné zložky: nie sú

Detašované pracoviská: nie sú

**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 do 35 rokov		F	P	T	O
		M	Ž	M	Ž				
<b>Celkový počet zamestnancov</b>	45	30	15	4	2	41	36.32	20.46	0
<b>Vedeckí pracovníci</b>	23	21	2	3	0	19	18.16	16.38	0
<b>Odborní pracovníci VŠ</b> (výskumní a vývojoví zamestnanci <sup>1</sup> )	7	4	3	1	2	7	4.46	2.08	0
<b>Odborní pracovníci VŠ</b> (ostatní zamestnanci <sup>2</sup> )	4	0	4	0	0	4	2.8	0	0

<b>Odborní pracovníci ÚS</b>	6	2	4	0	0	6	6	2	0
<b>Ostatní pracovníci</b>	5	3	2	0	0	5	4.9	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 pôsobiacich v zahraničí, v štátnych funkciách, členov Predsedníctva SAV, zamestnancov pôsobiacich v zastupiteľských zboroch)*

*F – fyzický stav zamestnancov k 31.12.2022 (bez riadnej materskej dovolenky, zamestnancov pôsobiacich v zahraničí v štátnych funkciách, členov Predsedníctva SAV, zamestnancov pôsobiacich 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 administratíve, správe a údržbe budov, upratovačiek, vodičov a pod.*

*M, Ž – muži, ženy*

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

Rodová skladba	Pracovníci s hodnosťou				Vedeckí pracovníci v stupňoch		
	DrSc.	CSc./PhD.	prof.	doc.	I.	II.a.	II.b.
<b>Muži</b>	3	15	3	2	4	6	11
<b>Ženy</b>	1	1	0	0	0	2	0

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

Veková štruktúra (roky)	< 31		31-35		36-40		41-45		46-50		51-55		56-60		61-65		> 65	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
<b>Muži</b>	0	0.0	3	1.9	5	4.5	1	0.5	0	0.0	2	2.0	1	1.0	1	1.0	4	4.0
<b>Ženy</b>	0	0.0	0	0.0	0	0.0	1	1.0	0	0.0	0	0.0	1	1.0	0	0.0	0	0.0

*A - Prepočet bez zohľadnenia úväzkov zamestnancov*

*B - Prepočet so zohľadnením úväzkov zamestnancov*

Tabuľka 1d Priemerný vek zamestnancov organizácie k 31.12.2022

	Kmeňoví zamestnanci	Vedeckí pracovníci	Riešitelia projektov
<b>Muži</b>	49.6	46.5	49.5
<b>Ženy</b>	51.0	51.5	49.5
<b>Spolu</b>	50.0	46.9	49.5

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

## 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>	6	0	48828	44102	-	-	-	-
<b>2. Projekty APVV</b>	4	0	-	-	180368	164605	-	-
<b>3. Projekty EŠIF/OP ŠF</b>	0	0	-	-	-	-	-	-
<b>4. Projekty SASPRO, MoRePro, IMPULZ</b>	2	0	23630	23630	21920	21920	-	-
<b>5. Iné projekty (FM EHP, Vedecko-technické projekty, na objednávku rezortov a pod.)</b>	0	0	-	-	-	-	-	-

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	
<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	0	-	-	-	-	-	-
<b>2. Projekty ERA.NET, ESA, JRP</b>	0	0	-	-	-	-	-	-
<b>3. Projekty COST</b>	0	0	-	-	-	-	-	-
<b>4. Projekty EUREKA, NATO, UNESCO, CERN, IAEA, IVF, ERDF a iné</b>	0	0	-	-	-	-	-	-
<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>	0	0	-	-	-	-	-	-
<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>		

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

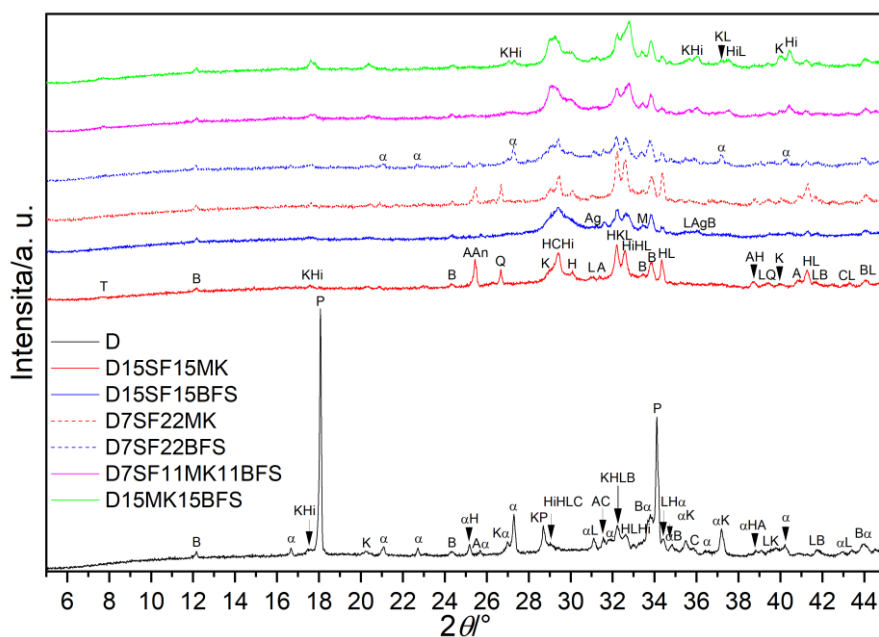
Služi aj na výber výsledkov do výročnej správy SAV. Každý výsledok má byť charakterizovaný stručným, všeobecne zrozumiteľným popisom – maximálne 1000 znakov + 1 obrázok; bibliografický údaj uvádzajte rovnako ako v zozname publikačnej činnosti, vrátane IF. Nadpis by mal vystihnúť prínos a význam výsledku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

#### 2.3.1. Výsledky na báze základného výskumu

##### (1) Termická stabilita fáz vzniknutých hydrotermálnym ošetrením cementu triedy G s rôznymi puzolánovými a latentne hydraulickými prísadami pri vysokých tlakoch.

**Riešitelia:** E. Kuzielová, M. Slaný, M. Žemlička, M. Palou.

Mnohozložkové cementové kaše pripravené z cementu triedy G, kremičitého úletu (SF), metakaolínu (MK) a jemne mletej vysokopečnej trosky (BFS) boli podrobené ošetreniu v prostredí simulujúcom hydrotermálne podmienky pri súčasnom pôsobení zvýšeného tlaku 180 bar a teploty 150 °C. Štúdia vytvorených fáz a ich vzťah s pevnosťou v tlaku bola vykonaná s pomocou FTIR, TGA a RTG. Štruktúra a množstvo vzniknutých fáz závisí od použitej kombinácie doplnkových cementových materiálov. Ich rozdielna reaktivita v čase hrá kľúčovú úlohu v tvorbe želaných fáz. Najväčšie množstvo žiadaných kremičitanových a hlinito-kremičitanových fáz vzniklo v zložení s rovnakým množstvom SF a MK. To sa odzrkadlilo aj v pevnosti v tlaku (48 MPa). Detegovanými fázami boli *tobermorit*, *hibschit* a *katoit*. Naopak, vo vzorkách s BFS bolo zaznamenané nižšie množstvo vytvorených hydratačných fáz, ktoré zároveň podliehali neželaným teplotným transformáciám, kde najviac zastúpenou fázou bol neželený  $\alpha$ -C<sub>2</sub>SH. To malo vplyv na pokles pevnosti v tlaku (~ 10 MPa).



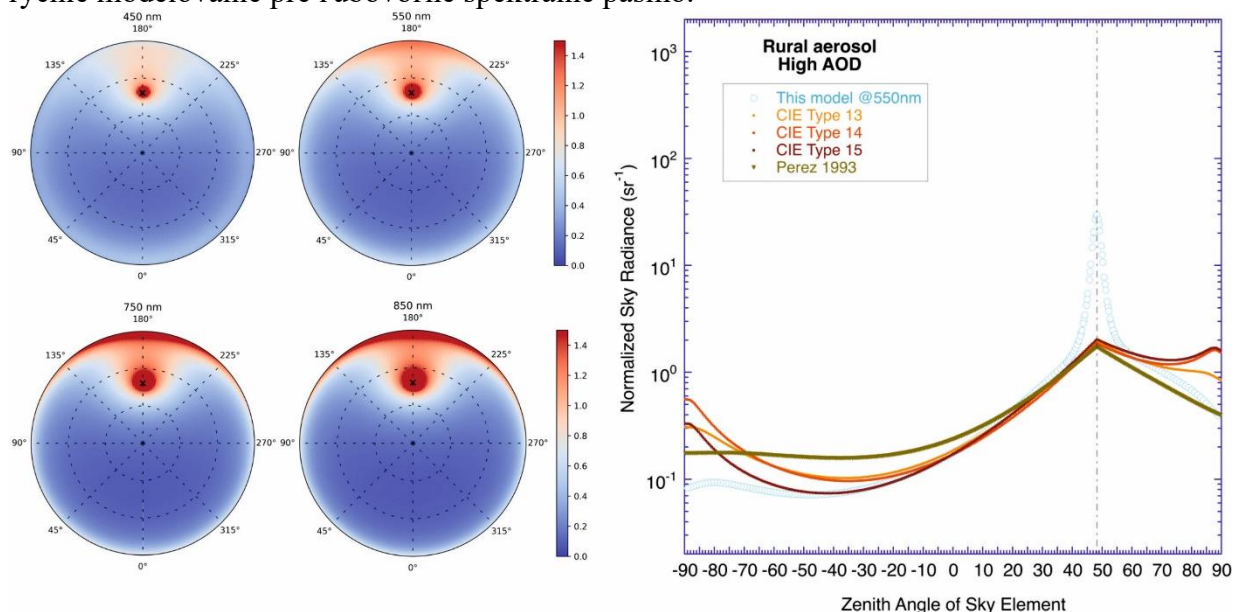
Obr. Záznamy röntgenovej difrakčnej analýzy študovaných cementových kompozitov.

E. Kuzielová, M Slaný, M. Žemlička, J. Másilko, P. Šiler, MT. Palou. Thermal stability of the phases developed at high-pressure hydrothermal curing of class G cement with different pozzolanic and latent hydraulic additives. In Journal of Thermal Analysis and Calorimetry, 2022, vol. 147, no. 18, p. 9891-9902 ADC, 4.755 – IF, Q1.

## (2) Globálny model spektrálnej žiary oblohy

**Riešitelia:** (SAV: M. Kocifaj), (USA: Ch. Gueymard)

Efektívne využitie fotovoltaiky (PV) v rôznych podmienkach vyžaduje modely zohľadňujúce aj difúziu zložku žiarenia. Mnohé zo súčasných výkonných modelov nie sú dostatočne adaptibilné pre globálne využitie, pretože nereagujú na silnú premenlivosť zloženia aerosólu v rôznych lokalitách a neposkytujú relevantné predpovede pre širokú oblasť spektra. Náš model je univerzálnejší a umožňuje hodnotenie PV staníc kdekoľvek na svete. Využitím kombinácie troch funkcií rozptylu dosahuje vysokú presnosť pri výpočte žiarenia v blízkom okolí Slnka (výhodné pre slnečné koncentrátoary) ako aj na horizonte oproti pozícii Slnka. Analytické riešenie je navyše prelomové aj pre súčasné modely svetelného znečistenia, pretože: a) funguje dobre pre malé uhly rozptylu, t.j. pre svetelné emisie deponované na veľkú vzdialenosť od mesta, b) kombinuje rôzne typy aerosólov, t.j. umožňuje klasifikáciu na základe prevládajúceho typu znečistenia v regióne, c) poskytuje extrémne rýchle modelovanie pre ľubovoľné spektrálne pásmo.



Vľavo: normalizovaná žiara oblohy pre štyri vlnové dĺžky a zenitový uhol Slnka 48°. Vpravo: v porovnaní s doterajšími CIE modelmi CIE a Perezovým modelom, je nové riešenie oveľa presnejšie pre okoloslnecnú zónu a pre spätný rozptyl.

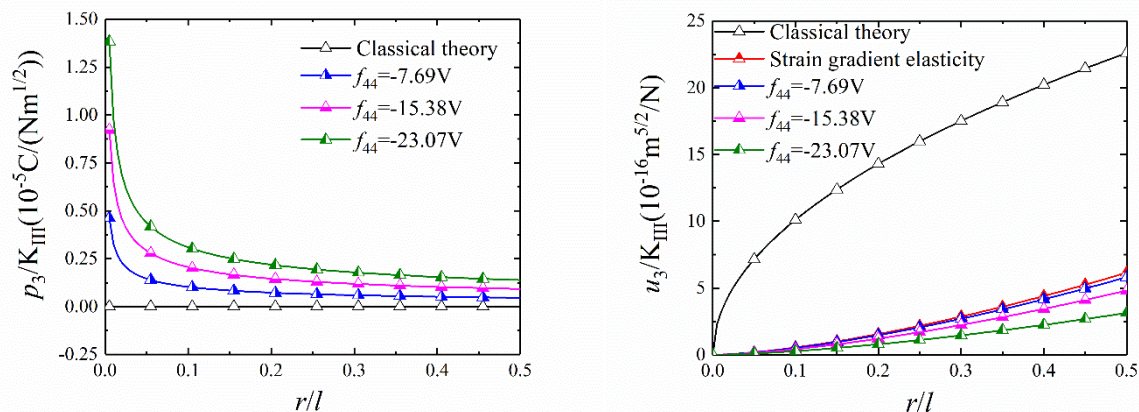
GUEYMARD, CH. A. - KOCIFAJ, Miroslav. Clear-sky spectral radiance modeling under variable aerosol conditions. In Renewable and Sustainable Energy Reviews, 2022, vol. 168, art. no. 112901. (2021: 16.799 - IF, Q1 - JCR, 3.678 - SJR, Q1 - SJR). ISSN 1364-0321. Dostupné na: <https://doi.org/10.1016/j.rser.2022.112901>. Typ: ADCA

## (3) Analytické riešenia úloh s trhlinami pre mode III pri flexoelektrickom efekte. (APVV SK-18-0004).

**Riešitelia:** J. Sládek, V. Sládek

Koncentrácie napätí v okolí koreňa trhliny znásobujú flexoelektrický efekt v dielektrikách, čo otvára nové možnosti jeho využitia v materiálových vedách. V odvodených formuláciách je zahrnutá priama aj konverzná flexoelektricitá a ich aplikovaním pre trhlinu v nekonečnej rovine sme zostrojili asymptotické distribúcie pre polia premiestnení, elektrickej polarizácie, gradientov deformácií

a skutočných fyzikálnych napätí v analytickom tvare. Pre analýzu vplyvu flexoelektického efektu na porušenie konštrukcií sme odvodili dráhovo nezávislý J-integrál. Získané výsledky (obr.) ukázali, že s narastajúcou hodnotou koeficientu flexoelektricity narastá polarizácia a klesajú hodnoty normálových premiestnení na povrchu trhliny. Flexoelektrický efekt vedie k redukcii hodnôt J-integrálu, čo znižuje nebezpečenstvo porušenia konštrukcie s trhlinami. Tento fenomén je významný predovšetkým v mikro-konštrukciách, kde je flexoelektrický efekt výraznejší v dôsledku vyšších hodnôt gradientov deformácií.



Distribution of the out-of-plane electric polarization  $p_3$  and displacement  $u_3$  on the upper crack surface

TIAN, Xinpeng - XU, Mengkang - ZHOU, Haiyang - DENG, Qian\*\* - LI, Qun\*\* - SLÁDEK, Ján - SLÁDEK, Vladimír. Analytical Studies on Mode III Fracture in Flexoelectric Solids. In Journal of Applied Mechanics, 2022, vol. 89, no. 4, art. no. 041006. (2021: 2.794 - IF, Q2 - JCR, 0.774 - SJR, Q1 - SJR). ISSN 0021-8936. Dostupné na: <https://doi.org/10.1115/1.4053268>

### 2.3.2. Výsledky aplikačného typu

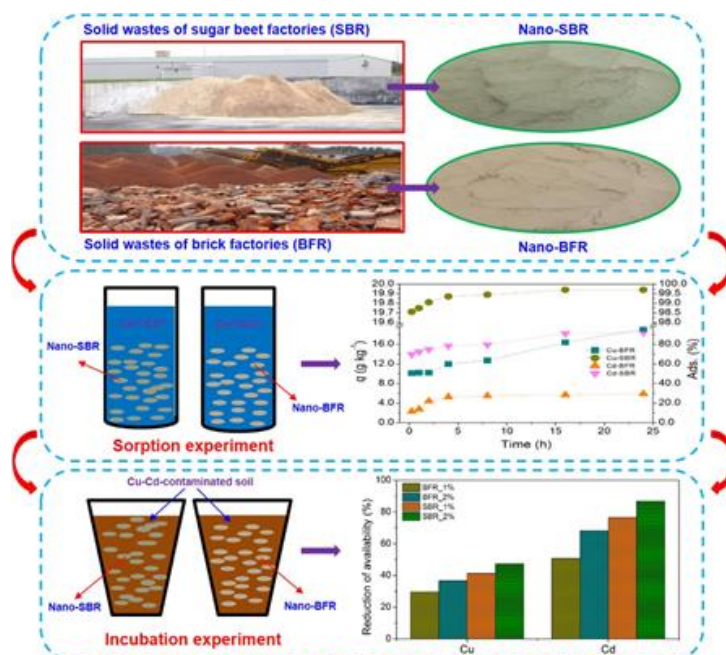
#### (1) Sanácia vody a pôdy kontaminovanej Cd a Cu pomocou nových nanomateriálov získaných zo spracovania cukrovej repy a pevných odpadov z ílovo-hlinených tehál

Riešiteľ: M. Slaný

Odberateľ: University of Wuppertal, School of Architecture and Civil Engineering, Institute of Foundation Engineering, Water, and Waste-Management, Laboratory of Soil, and Groundwater-Management, Pauluskirchstraße 7, 42285 Wuppertal, Germany

V tejto práci boli vyrobené a plne charakterizované dva nové ekologické nanomateriály zo spracovania cukrovej repy (SBR) a zvyškov z ílových tehál (BFR). Bola zhodnotená ich schopnosť sorpcie Cd a Cu vo vode a zníženie dostupnosti ťažkých kovov v kontaminovanej pôde. SBR odstránil až 99% Cu a 91% Cd vo vode a vykazoval výrazne rýchlejšiu a vyššiu sorpčnú kapacitu v porovnaní s BFR, dokonca aj pri kyslom pH. Dostupnosť pôdneho kovu bola výrazne znížená SBR (až o 57% pre Cu a 86 % pre Cd) a BFR (až 36 % pre Cu a 68 % pre Cd) v porovnaní s neupravenou pôdou. Vyššiu účinnosť odstraňovania SBR oproti BFR možno pripísať jeho vyššej zásaditosti (pH = 12,5), obsahu uhličitanov (82 %) a veľkosti špecifického merného povrchu. Hlavnými reaktívnymi skupinami, ktoré mohli hrať dôležitú úlohu pri sorpcii Cd a Cu oboma materiálmi a boli identifikované pomocou FTIR spektroskopie boli hydroxyl-OH skupiny, Si-O, Al-O a Fe-O.





Obr. Účinnosť nízkonákladových nanomateriálov zo spracovania cukrovej repy (SBR) a odpadu z ílovo-hlínových tehál (BFR) na sanáciu vody a pôdy znečistenej Cd a Cu

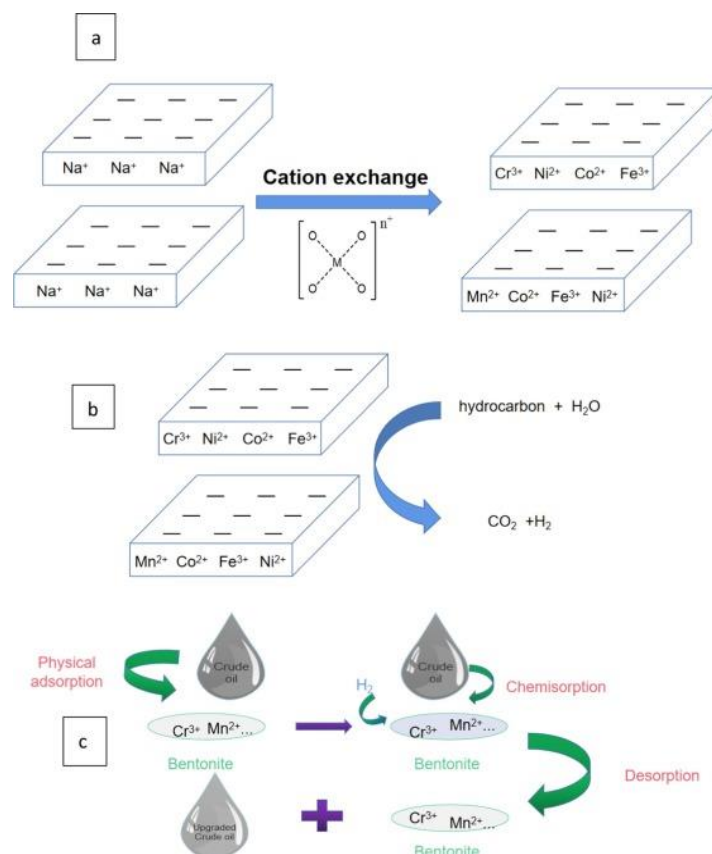
LASHEN, Zahraa M. - SHAMS, Mohamed S. - EL-SHESHTAWY, Hamdy S. - SLANÝ, Michal - ANTONIADIS, Vasileios - YANG, Xing - SHARMA, Gaurav - RINKLEBE, Jörg - SHAHEEN, Sabry M.\*\* - ELMAHDY, Shimaa M. Remediation of Cd and Cu contaminated water and soil using novel nanomaterials derived from sugar beet processing- and clay brick factory-solid wastes. In Journal of Hazardous Materials, 2022, vol. 428, p. 128205-1-128205-11. (2021: 14.224 - IF, Q1 - JCR, 1.991 - SJR, Q1 - SJR). ISSN 0304-3894. Dostupné na: <https://doi.org/10.1016/j.jhazmat.2021.128205>

## (2) Vplyv ílových minerálov rôzneho typu a etanolu ako donoru vodíka na katalytickú akvatermolýzu ťažkého oleja

**Riešitelia:** M. Slaný, E. Kuzielová

**Odebrateľ:** State Key Laboratory of Petroleum Pollution Control, Xi'an Shiyou University, Xi'an, China

Tento výskum dokázal, že ílové minerály aj neílové minerály majú katalytický účinok na aquatermolýzu ropy. Sodný íl preukázal najlepší katalytický účinok vo všeobecnosti, zatiaľ čo sulfid železnatý vykazoval najlepší katalytický účinok spomedzi neílových minerálov. Metanol sa ukázal ako najvhodnejší donor na zvýšenie účinnosti pre zníženie viskozity. Za optimálnych podmienok katalytickej aquatermolýzy môže miera zníženia viskozity dosiahnuť až 87,32% v porovnaní s pôvodným ťažkým olejom. Na štúdium zmien vyskytujúcich sa počas katalytickej aquatermolýzy ropy sa použili diferenciálna skenovacia kalorimetria (DSC), infračervená spektrometria (FTIR), termogravimetrická analýza (TGA), elementárna analýza a plynová chromatografia-hmotnostná spektrometria (GC-MS). Okrem toho bolo vybraných niekoľko rôznych modelových zlúčenín (1-oktén, tiofén, fenol, pyridín, chinolín, benzotiofén a nonylfenol) na simuláciu chemických zmien zložiek ropy a na návrh reakčných mechanizmov.



Obr. Katalytická akvatermolýza na zníženie viskozity ťažkej ropy pomocou sodného bentonitu

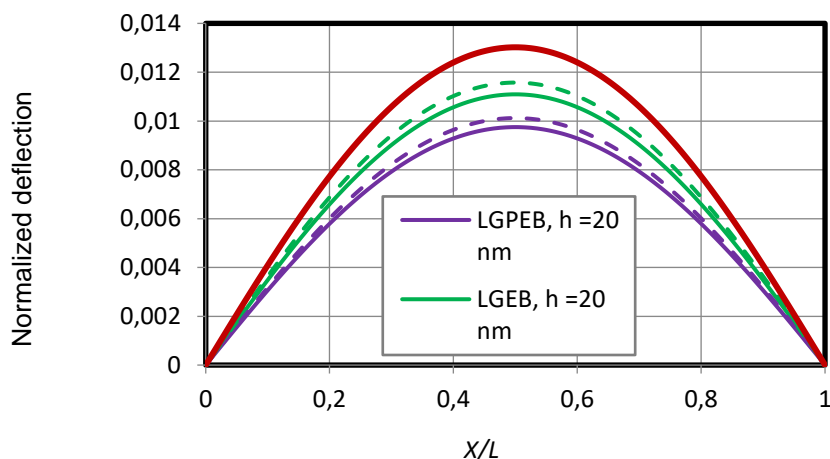
ZHOU, Zhichao - SLANÝ, Michal\*\* - KUZIELOVÁ, Eva - ZHANG, Wangyuan - MA, Liwa - DONG, Sanbao - ZHANG, Jie - CHEN, Gang\*\*. Influence of reservoir minerals and ethanol on catalytic aquathermolysis of heavy oil. In *Fuel*, 2022, vol. 307, p. 121871-1-121871-11. (2021: 8.035 - IF, Q1 - JCR, 1.514 - SJR, Q1 - SJR). ISSN 0016-2361. Dostupné na: <https://doi.org/10.1016/j.fuel.2021.121871>

### 2.3.3. Výsledky na báze medzinárodnej spolupráce

**(1) Lokálne gradientna teória pre dielektrika s neklasickým zákonom vedenia tepla: termopolarizačný a flexoelektrický efekt. (SK-UA-21-0010, SK-CN-RD-18-0005).**

**Riešitelia:** Institute of Construction and Architecture SAS: Hrytsyna O., Hrytsyna M.; Pidstryhach Institute for Applied Problems of Mechanics and Mathematics, National Academy of Sciences of Ukraine: Tokovyy Y. V.

S využitím základných princípov nerovnovážnej termodynamiky, mechaniky kontinua a elektrodynamiky je navrhnutá nová neklasická teória termoelastických kryštalických dielektrík. Teória je založená na zovšeobecnení vzťahu medzi tepelnými a entropickými tokmi a berie do úvahy proces lokálneho posuvu hmotnosti, spôsobeného zmenami v materiálovej mikroštruktúre. Pre uvažované kontinuum sú formulované konštitutívne rovnice gradientného typu a zákon nelokálneho vedenia tepla (zovšeobecnený Fourierov zákon). Teória sa používa na štúdium odozvy elektrickej polarizácie izotropnej vrstvy na teplotný gradient; na skúmanie zviazaných polí v jednoducho podoprenom piezoelektrickom nano-nosníku zaťaženom distribuovanou silou; a na štúdium zviazaných polí v dutom valci zaťaženom mechanickým tlakom a elektrickým napätím. Analytické riešenia demonštrujú, že oproti klasickej teórii nová teória popisuje termopolarizačný efekt v izotropných materiáloch, veľkostný, priamy a inverzný flexoelektrický efekty.



**Fig. 1.** Normalized deflection  $w/w_*$  of simply-supported beams with different beam thicknesses 10 nm and 20 nm

**HRYSYNA, Olha.** Electromechanical fields in a hollow piezoelectric cylinder under non-uniform load: flexoelectric effect. In *Mathematics and Mechanics of Solids*, 2022, vol. 27, no. 2, p. 262-280. (2021: 2.719 - IF, Q2 - JCR, 0.773 - SJR, Q1 - SJR). ISSN 1081-2865. Dostupné na:

<https://doi.org/10.1177/10812865211020785>

**HRYSYNA, Olha.** The effect of local mass displacement on coupled fields in dielectrics. In *Applied Nanoscience*, 2022, vol. 12, no. 3, p. 711-723. (2021: 3.869 - IF, Q3 - JCR, 0.505 - SJR, Q2 - SJR). ISSN 2190-5509. Dostupné na: <https://doi.org/10.1007/s13204-021-01714-w>

**HRYSYNA, Olha, TOKOVYY, Yuriy V., HRYSYNA, Maryan.** Local gradient theory for dielectrics with non-classical heat conduction law. *SKOZRIT, Ivica - SORIČ, Jurica - TONKOVIC, Zdenko. ICCSM 2022: Proceedings of the 10th International Congress of Croatian Society of Mechanics*. - Zagreb, Croatia: Croatian Society of Mechanics, 2022, p. 137-138. ISBN 2623-6133.

### 2.3.4 Ostatné významné výsledky

#### Veľkostný efekt v piezo-elektrických polovodičových nano-konštrukciách.

**Riešitelia:** J. Sládek, V. Sládek, M. Repka

Ak sú rozmery polovodičovej piezoelektrickej konštrukcie redukované na nano rozmery, takzvaný veľkostný efekt vplyva na správanie sa konštrukcie. Kvôli matematickej zložitosti problému bola vyvinutá numerická metóda, takzvaná zmiešaná metóda konečných prvkov. Numerické príklady ukazujú, že odozva piezoelektrickej polovodičovej konštrukcie môže byť značne ovplyvnená počiatočnou elektrónovou hustotou a flexoelektrickým koeficientom. Vplyv veľkostného efektu, ktorý je typický pre veľmi malé konštrukcie bol demonštrovaný pre votknutý nosník zaťažený silou na konci nosníka, so vzrastajúcim flexoelektrickým koeficientom sa priehyb znižuje. Na druhej strane priehyb môže byť zväčšený väčšími hodnotami počiatočnej hustoty elektrónov.

**SLÁDEK, Ján\*\* - SLÁDEK, Vladimír - REPKA, Miroslav - PAN, E.** Size effect in piezoelectric semiconductor nanostructures. In *Journal of Intelligent Material Systems and Structures*, 2022, vol. 33, no. 11, p. 1351-1363. (2021: 2.774 - IF, Q3 - JCR, 0.620 - SJR, Q2 - SJR). ISSN 1045-389X. Dostupné na: <https://doi.org/10.1177/1045389X211053049>

#### Vplyv nesféricity atmosférického aerosólu na jas nočnej oblohy

**Riešitelia:** L. Kómar, S. Wallner, M. Kocifaj

Väčšina v súčasnosti používaných modelov prenosu žiarenia je založená na Mieho teórii pre sférické homogénne častice, avšak sférické tvary sú zriedkavé pre prírodné aj antropogénne aerosóly. Štúdiá sa zaoberá kvantifikovaním efektu neféricity častíc pri modelovaní jasno nočnej oblohy. Na modelovanie používame T-maticový formalizmus rozptylu svetla na sféroidálnych časticách ľubovoľnej veľkosti, zloženia a orientácie vzhľadom na dopadajúce svetlo. Výsledky naznačujú, že vplyv tvaru častíc na jas nočnej oblohy môže byť až 70%, predovšetkým okolo zenitu, keďže kľúčovým sa stáva rozptyl svetla do uhlov cca. 90° - 120°. Dôsledkom toho môže byť systematické

podhodnotenie alebo nadhodnotenie zenitného jasu pri modelovaní a následnom porovnávaní s meraniami pomocou SQM zariadení.

Kómar L., Wallner S., Kocifaj M. The significant impact of shape deviations of atmospheric aerosols on light monitoring networks. In Monthly Notices of the Royal Astronomical Society, 2022, vol. 512, p. 1805-1813. (2021: 5.235 - IF, Q1 - JCR, 1.678 - SJR, Q1 - SJR, karentované - CCC). (2022 - Current Contents, WOS, SCOPUS, NASA ADS). ISSN 0035-8711. Dostupné na: <https://doi.org/10.1093/mnras/stac548>

### **Kinetika a mechanizmy hydratačných reakcií G-Dyckerhoff cementu pomocou termickej metódy.**

**Riešitelia:** M. Palou, E. Kuzielová, M. Žemlička, J. Podhorská, J. Čepčianska

Simultánny efekt teploty (25, 40, 50, 60, 80 °C) a materiálového zloženia kompozitných cementov na báze cementu G- Dyckerhoff s rôznymi úrovňami substitúcie vysokou troskovou pecou, metakaolínom a vápencom boli analyzované za účelom identifikácie hydratačných produktov a výpočtu aktivačnej energie rôznych reakcií pomocou vodivostného kalorimetra a termogravimetrickej metódy. Bolo pozorovaných viac konkrétnych javov charakterizujúcich rôzne hydratačné reakcie cementových kompozitov, ktorých intenzity a čas závisia od teplôt a zloženia materiálov. Zdanlivé aktivačné energie vypočítané z hydratačných pík charakterizujúcich rôzne reakcie klesajú so substitúciou. Termogravimetrická analýza vzoriek po kalorimetrickom meraní ukazuje, že množstvo hydratačných produktov závisí od materiálového zloženia materiálu a teplôt hydratácie.

PALOU, Martin T. - NOVOTNÝ, Radoslav - KUZIELOVÁ, Eva - ŽEMLIČKA, Matúš - ČEPČIANSKA, Jana - PODHORSKÁ, Janette. The influence of supplementary cementitious materials on the hydration of Dyckerhoff G-Oil cement. In Journal of Thermal Analysis and Calorimetry, 2022, vol. 147, no. 18, p. 9935-9948. (2021: 4.755 - IF, Q1 - JCR, 0.639 - SJR, Q2 - SJR). ISSN 1388-6150. Dostupné na: <https://doi.org/10.1007/s10973-022-11444-y>

### **Skoré a stredné štádiá hydratácie viaczložkových cementových spojív ovplyvnené pôsobením geotermálnej vody a vyšších teplôt.**

**Riešitelia:** E. Kuzielová, M. Slaný, M. Žemlička, M. Palou

V predmetnej štúdií sme sa zamerali na preskúmanie vplyvu geotermálneho roztoku na skoré a stredné štádiá hydratácie viaczložkových cementových materiálov. Zloženie roztoku zodpovedalo zloženiu reálnej geotermálnej vody NaCl typu s obsahom uhličitanov. Bolo preukázané, že geotermálny roztok spomaľuje reakcie v skorých štádiách hydratácie pri všetkých aplikovaných teplotách (20 °C, 60 °C a 80 °C). Naopak, v neskorších štádiách (po 40 hod.) bol vyšší stupeň hydratácie dosiahnutý v prítomnosti geotermálneho roztoku.

E. Kuzielová, M. Tatarko, M. Slaný, M. Žemlička, J. Másilko, R. Novotný, MT. Palou. Early and middle stages of multicomponent cement hydration under the effect of geothermal water and increased temperatures. Geothermics. 2023; Volume 108, <https://doi.org/10.1016/j.geothermics.2022.102632> ADC, 4.566 – IF, Q1

## **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/ 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>37 / 0</b>
<b>10. Vedecké práce registrované vo Web of Science Core Collection alebo Scopus (ADMA, ADMB, ADNA, ADNB)</b>	<b>5 / 1</b>
<b>11. Vedecké práce v ostatných domácich časopisoch (ADFA, ADFB)</b>	<b>0 / 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>6 / 2</b>
<b>16. Publikované príspevky na zahraničných vedeckých konferenciách (AFA, AFC)</b>	<b>4 / 0</b>
<b>17. Vydané periodiká evidované v CCC, WoS Core Collection, SCOPUS</b>	<b>0</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

<b>Kvartil vedeckého časopisu</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Spolu</b>
<b>Podľa IF z r. 2021 (zdroj JCR)</b> <i>Počet článkov / doplnky</i>	27 / 0	7 / 0	4 / 0	0 / 0	38 / 0
<b>Podľa SJR z r. 2021 (zdroj Scimago)</b> <i>Počet článkov / doplnky</i>	28 / 0	10 / 0	2 / 0	2 / 1	42 / 1

Tabuľka 2g Ohlasy

OHLASY	Počet v r. 2021/ doplňky z r. 2020
Citácie vo WOS (1.1, 2.1)	934 / 6
Citácie v SCOPUS (1.2, 2.2)	99 / 6
Citácie v iných citačných indexoch a databázach (9, 10, 3.2, 4.2)	0 / 0
Citácie v publikáciách neregistrovaných v citačných indexoch (3, 4, 3.1, 4.1)	0 / 0
Recenzie na práce autorov z organizácie (5, 6, 7, 8)	0 / 0

## 2.5. Aktívna účasť na vedeckých podujatiach

Tabuľka 2h Vedecké podujatia

Prednášky a vývesky na medzinárodných vedeckých podujatiach	38
Prednášky a vývesky na národných vedeckých podujatiach	4

## 2.6. Vyžiadané prednášky

### 2.6.1. Vyžiadané prednášky na medzinárodných vedeckých podujatiach

J. Sladek plenárnu prednášku na medzinárodnej konferencii ICSID 2022 Dubrovnik, September 2022: Crack analyses in nano-sized structures under a Joule heating

J. Sladek na Summer School-Fatigue and Fracture Modelling and Analysis, Dubrovnik, September 2022 som predniesol 3-hodinovú prednášku: Advanced continuum models for crack analyses in nano-sized structures

M. Kocifaj: The next ten years: LPTMM Challenges for Preserving the Night Sky. The conference on Light Pollution: Theory, Modelling and Measurements, June 21-24 2022, Santiago de Compostela, Galicia (Spain).

M. Kocifaj: Computing high-order scattering. The conference on *Light Pollution: Theory, Modelling and Measurements*, June 21-24 2022, Santiago de Compostela, Galicia (Spain).

M. Kocifaj, A. Kocifajová: Ground-based methods to characterize the lower atmosphere. *2nd International Conference on Environmental and Astronomical Light Pollution*, September 2-3 2022, Niepołomice, Poland.

M. T. Palou: Design of the self-compacting heavyweight concrete. Keynote speaker at 25th In ICBMPT 2021. 25 th International Conference of the Research Institute for Building Materials “Building Materials, Products and Technologies“ September 29 - October 1, 2021, Telč, Czech Republic

M. T. Palou: Decarbonisation of the cement and construction industry through development of novel materials. 11TH INTERNATIONAL CONFERENCE OF THE AFRICAN MATERIALS RESEARCH SOCIETY, 12-15 December 2022, Venue: University Cheikh Anta Diop of Dakar

### 2.6.2. Vyžiadané prednášky na národných vedeckých podujatiach

### 2.6.3. Vyžiadané prednášky na významných vedeckých inštitúciách

- J. Sladek predniesol prednášku na UFM AV ČR, December 2022: Crack analyses in nano-sized structures under a Joule heating
- V. Sladek predniesol prednášku na UFM AV ČR, December 2022: Higher-grade theory of heat conduction in solids
- M. Kocifaj: Atmospheric optics. Light Pollution: Meteorology and astronomy – How air pollution makes stars disappear. March 17 2022, Kuffner Observatory, Austria.
- S. Darula - Svetlotechnika – FEKT VUT v Brne

### 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

b) v zahraničí

#### 2.7.2. Vynálezy prihlásené v roku 2022

a) na Slovensku

b) v iných krajinách ako prioritná prihláška

c) PCT

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

#### 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
-----------------	-----------------------------	-------------------

		<b>projektov</b>
Čekon Miroslav	KEGA	2
Matiašovský Peter	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
Čekon Miroslav	0	0	21	0	0	0	0
Čurpek Jakub	0	0	6	0	0	0	5
Darula Stanislav	0	0	1	0	0	0	0
Hrytsyna Olha	0	0	1	0	0	0	0
Kocifaj Miroslav	0	0	19	0	0	0	1
Kómar Ladislav	0	0	4	0	0	0	3
Kuzielová Eva	0	0	8	0	0	0	0
Matiašovský Peter	0	0	0	0	0	0	10
Palou Martin-T.	0	1	30	3	1	0	0
Petržala Jaromír	0	0	5	0	0	0	0
Sátor Ladislav	0	0	2	0	0	0	0
Slaný Michal	0	0	7	0	0	0	0
Sládek Ján	0	0	14	0	0	0	0
Sládek Vladimír	0	0	11	0	0	0	3
Slávik Richard	0	0	3	0	0	0	10
Solano Lamphar Hector Antonio	0	1	9	0	0	0	2
Wallner Stefan	0	0	5	2	0	0	0
<b>Spolu</b>	<b>0</b>	<b>2</b>	<b>146</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>34</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					
	celkový počet		z toho novoprijatí				Ukončenie z dôvodov					
	M	Ž	M	Ž	M	Ž	ukončenie úspešnou obhajobou		predčasné ukončenie		neúspešné ukončenie	
	M	Ž	M	Ž	M	Ž	M	Ž	M	Ž	M	Ž
<b>Denná zo zdrojov SAV</b>	1	3	1	0	0	2	0	1	0	0	0	0
<b>Denná z iných zdrojov</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>Externá</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>Spolu</b>	0	3	0	0	0	1	0	0	0	0	0	0
<b>Z toho zahraničných</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>Súhrn</b>	4		1		2		1		0		0	

Uvádzajte 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	0	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
Ing. Janette Podhorská, PhD.	denná	9. 2017	8. 2022	5.2.8 stavebníctvo	prof. Dr. Ing. Martin-T. Palou, ÚSTARCH SAV, v. v. i.	Stavebná fakulta STU v Bratislave

### 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
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### 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
0	0	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	Zahranční doktorandi štátne občianstvo/počet
0	0	0	

Zahranční 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)
Chemické inžinierstvo a technológie	2820	Anorganická technológia a materiály	Fakulta chemickej a potravinárskej technológie STU
Stavebníctvo	3659	Stavebníctvo	Stavebná fakulta STU
Strojárstvo	2381	Aplikovaná mechanika	Strojárska fakulta 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 hodnosť alebo vyšší kvalifikačný stupeň
doc. Ing. Miroslav Čekon, PhD. (stavebníctvo)	doc. Ing. Stanislav Darula, CSc. (Stavebná fakulta TUKE)	doc. Ing. Miroslav Čekon, PhD. (IIa)
doc. Ing. Stanislav Darula, CSc. (stavebníctvo)	Ing. Peter Matiašovský, CSc. (Slovenská technická univerzita v Bratislave)	Mgr. Jaromír Petržala, PhD. (IIa)
Mgr. Miroslav Kocifaj, DrSc. (meteorológia a klimatológia)	Ing. Peter Matiašovský, CSc. (Stavebná fakulta STU)	Mgr. Miroslav Kocifaj, DrSc. (DrSc., Fakulta matematiky, fyziky a informatiky UK)
Ing. Peter Matiašovský, CSc. (stavebníctvo)	Mgr. Hector Antonio Solano Lamphar, PhD. (UNAM, Mexico City, Mexico)	

Prof.Dr.Ing. Martin-Tchingnabé Palou (anorganická technológia a materiály)		
Prof.Dr.Ing. Martin-Tchingnabé Palou (stavebníctvo)		
Prof. Ing. Ján Sládek, DrSc. (aplikovaná mechanika)		
Prof. RNDr. Vladimír Sládek, DrSc. (aplikovaná mechanika)		
Prof. RNDr. Vladimír Sládek, DrSc. (numerická analýza a vedecko-technické výpočty)		

### 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	6	3	2	1
Celkový počet hodín v r. 2022	176	108	97	52

*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	3
2.	Počet vedených alebo konzultovaných diplomových a bakalárskych prác	24
3.	Počet pracovníkov, ktorí pôsobili ako školitelia doktorandov (PhD.)	5
4.	Počet školených doktorandov (aj pre iné inštitúcie)	12
5.	Počet oponovaných dizertačných a habilitačných prác	7
6.	Počet pracovníkov, ktorí oponovali dizertačné a habilitačné práce	5
7.	Počet pracovníkov, ktorí pôsobili ako členovia komisií pre obhajoby DrSc. prác	0
8.	Počet pracovníkov, ktorí pôsobili ako členovia komisií pre obhajoby PhD. prác	4
9.	Počet pracovníkov, ktorí pôsobili ako členovia komisií, resp. oponenti v inauguračnom alebo habilitačnom konaní na vysokých školách	4

### 3.9. Iné dôležité informácie k pedagogickej činnosti

## 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

Central European Symposium on Building Physics 2022, Bratislava, SR, September 5-9. 2022,

International Conference on Light Pollution Theory, Modelling and Measurements, 21–24. 6. 2022, Santiago de Compostela, Galicia, Spain.

#### 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
Čekon Miroslav	0	0	1
Čurpek Jakub	0	1	0
Hrytsyna Olha	1	0	0
Kocifaj Miroslav	1	0	1
Kómar Ladislav	0	1	0
Matiašovský Peter	0	0	1
Sládek Ján	2	1	0
Sládek Vladimír	1	0	0
Slávik Richard	0	1	0
Solano Hector	0	0	1
<b>Spolu</b>	1	3	4

### 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. Miroslav Čekon, PhD.

International Building Performance Simulation Association IBPSA-SK Affiliate (funkcia: člen)

International Association of Building Physics (IABP) (funkcia: člen)

Ing. Jakub Čurpek, PhD.

IBPSA - International Building Performance Simulation Association (funkcia: IBPSA-Slovakia Representative)

International Association of Building Physics (IABP) (funkcia: Člen)

doc. Ing. Stanislav Darula, CSc.

CIE - Commission Internationale de l' Eclairage (funkcia: Repräsentant SR v CIE Divízii 3)  
IBPSA – the International Building Performance Simulation Association (funkcia: člen)

Mgr. Miroslav Kocifaj, DrSc.

International Astronomical Union (funkcia: člen)  
International Solar Energy Society (ISES) (funkcia: člen {silver member})  
Optical Society of America (OSA) (funkcia: člen)  
The Illuminating Engineering Society (funkcia: člen Sky Glow Committee)

Prof.Dr.Ing. Martin-Tchingnabé Palou

CIB- International Council for Research and Innovation in Building and Construction (funkcia: Člen)  
ICIC International Committee for Irradiated Concrete (funkcia: člen)

Ing. Ladislav Sátor, PhD.

Verejný zbor Maďarskej akadémie vied (funkcia: člen)

Prof. Ing. Ján Sládek, DrSc.

Central European Assoc. for Computational Mechanics (funkcia: člen)  
Int. Soc. Comput. Eng. & Sciences (ICCES) (funkcia: člen)

Prof. RNDr. Vladimír Sládek, DrSc.

Central European Assoc. for Computational Mechanics (funkcia: člen)  
International Society for Boundary Elements (funkcia: člen )

Mgr. Hector Antonio Solano Lamphar, PhD.

Scientific organization (funkcia: member)

Dr. Stefan Wallner, BSc MSc

Austrian Society for Astronomy and Astrophysics (funkcia: Executive Board Member)  
International Astronomical Union (funkcia: Junior Member)

#### 4.3. Účast' 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
Solano Lamphar Hector Antonio	CONACYT	2

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

Výsledky Dr. H. A. Solano-Lamphar získané v rámci SAIA štipendia odhalili niektoré neočakávané dôsledky zvýšených úrovní svetelného znečistenia na populáciu, predovšetkým v urbanizovaných oblastiach. Zistené dopady svetelného znečistenia na kvalitu života v husto obývaných oblastiach vyžadujú hľadanie technologických a architektonických riešení na zníženie priameho aj difúzneho svetla v noci. SAIA projekt Dr. Solano-Lamphara bol mimoriadne úspešný a viedol k publikovaniu niekoľkých vedeckých prác v karentovaných časopisoch.

Súčasťou úspešnej práce Dr. Lamphara bol aj pobyt Joshua Iván Muñoz Salazara z University of Mexico (UNAM) na ústave v období od 1. do 31. júla 2022, ktorý bol zameraný na problematiku lepšieho využívania energetických zdrojov na osvetlenie miest v nočných hodinách.

*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)

Komisia medzinárodného panelu nás zaradila do kategórie B/C s nasledujúcim vysvetlením:

1. Väčšina medzinárodného uznania je spojená s aktivitami prof. Jána Sládeka. Na pracovisku existuje niekoľko vedcov, ktorí sú jasne viditeľní na úrovni EÚ; avšak mnohí stále nie sú viditeľní v medzinárodnom prostredí. Je potrebné vynaložiť viac úsilia pri vytváraní podmienok pre mladú generáciu, aby rástla a dosahovala vyššiu úroveň.
2. Panel dôrazne odporúča hľadať partnerov pre spoluprácu v podobných a synergických vedeckých odboroch medzi ostatnými akademickými ústavmi, s cieľom nájsť kľúčových partnerov a s nimi sa zamerať na významnejšie a ambicióznejšie výstupy.
3. Nová kancelária pre transfer technológií SAV by mala v budúcnosti aktívne využívaná ako prostriedok pre dosahovanie vyšších výnosov.
4. Ústav by mal mať oveľa lepšie štruktúrovaný vzťah s medzinárodným poradným výborom (rodové vyváženie popredných odborníkov v danej oblasti) a mať nástroj na implementáciu jeho návrhov a rád.
5. Získavanie (priťahovanie) doktorandov a postdoktorandov zo zahraničia v rámci európskych programov, ako aj v rámci štipendijných fondov pridelených vládou SR (SAIA), medzivládne dohody si vyžadujú ambicióznosť a ciele stratégie.
6. Ústav sa musí viac zapájať do programov EÚ, čo si však vyžaduje aj aktívnu pomoc zo strany SAV pri poskytovaní náležitej podpory pri príprave návrhov, budovaní konzorcia, príprave grantov a písaní návrhov projektov.
7. Rodová rovnosť v rámci Ústavu si tiež vyžaduje silnú a nepretržitú pozornosť.

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

Ústav sa od 1. 1. 2022 stal „verejnou výskumnou inštitúciou“ v rámci transformácie Slovenskej akadémie vied. V nasledujúcich bodoch sú zhrnuté opatrenia vyplývajúce z Akčného plánu ktoré priamo reagujú na odporúčania medzinárodného panelu z poslednej akreditácie, ktorý konštatoval „Ústav urobil počas tohto posledného kontrolného obdobia veľmi podstatný skok vpred (pozri všetky konkrétne pripomienky vyššie). Porota k tomu Ústav blahoželá.“

1. *Väčšina medzinárodného uznania je spojená s aktivitami prof. Jána Sládeka. Na pracovisku existuje niekoľko vedcov, ktorí sú jasne viditeľní na úrovni EÚ; avšak mnohí stále nie sú viditeľní v medzinárodnom prostredí. Je potrebné vynaložiť viac úsilia pri vytváraní podmienok pre mladú generáciu, aby rástla a dosahovala vyššiu úroveň.*

Sme hrdí, že medzinárodný hodnotiaci panel ocenil postavenie prof. Jána Sládeka a jeho dlhoročné aktivity na národnej i medzinárodnej úrovni. Toto tvrdenie nemusí vychádzať len z prezentácie či materiálov Akreditačného dotazníka pri posúdení ÚSTARCH v. v. i., ale aj z iných dostupných zdrojov. Za povšimnutie však stojí aj vedecká činnosť prof. Vladimíra Sládka, ktorý má rovnaké scientometrické parametre ako prof. Ján Sládek. Okrem týchto dvoch mimoriadnych vedeckých pracovníkov má náš ústav aj tretiu vedeckú osobnosť s vynikajúcim rastúcim vedeckým kreditom doma i v zahraničí. Mgr. Miroslav Kocifaj, DrSc. v poslednom období dosahuje vynikajúce výsledky s publikáciami v renomovaných časopisoch indexovaných v Nature. Má národné, európske a medzinárodné patenty a niekoľko ocenení. Títo traja vedeckí pracovníci tvoria piliere nášho ústavu. Pracovníci Oddelenia materiálov a konštrukcií majú tiež aktivity európskeho a medzinárodného charakteru.

Prof. Ján Sládek, DrSc., prof. Vladimír Sládek, DrSc., Mgr. Miroslav Kocifaj, DrSc. a prof. Dr. Ing. Martin T. Palou sa intenzívne venujú mladým vedeckým pracovníkom, nielen ich zapojením do riešenia projektov, ale najmä vytváraním materiálnych a infraštruktúrnych a finančných podmienok pre ich samostatný a cieľavedomý rast. Ich scientometrické charakteristiky z roka na rok rastú. Ústav už dnes neformálne spolupracuje s mnohými poprednými vedeckými pracoviskami, dôkazom čoho sú mnohé spoločné publikácie v popredných vedeckých časopisoch. V tomto trende budeme pokračovať a zapájať aj viaceré kolektívy ústavu.

- 2. Panel dôrazne odporúča hľadať partnerov pre spoluprácu v podobných a synergických vedeckých odboroch medzi ostatnými akademickými ústavmi, s cieľom nájsť kľúčových partnerov a s nimi sa zamerať na významnejšie a ambicióznejšie výstupy.*

Ústav stavebníctva a architektúry má v tomto prípade jasnú víziu a má záujem viesť rokovania s ďalšími ústavmi podobného zamerania o vytvorení väčšieho integrovaného ústavu technických vied. Jeho prioritou je efektívnejšie využívanie laboratórií v rámci vedeckých projektov. Naše špecializované prístrojové vybavenie je prístupné partnerským organizáciám SAV a univerzitám, ako aj pre využitie v praxi.

VR ÚSTARCh už má návrh názvu takéhoto ústavu, ktorý by zahŕňal ďalšie ústavy:

#### **Ústav základného technického výskumu – Institute of Fundamental Technological Research.**

- 3. Nová kancelária pre transfer technológií SAV by mala v budúcnosti aktívne využívať ako prostriedok pre dosahovanie vyšších výnosov.*

Kancelária transferu technológií SAV je novým orgánom s jasným programom. Musí však oslovovať ústavy a firmy, organizovať Workshopy a hľadať prieniky medzi vedeckými ústavmi SAV a aplikačnou sférou, vytvárať podmienky pre komercializáciu vedeckých výsledkov.

ÚSTARCh SAV, v. v. i., má eminentný záujem zapájať sa do aktivít nad rámec základného výskumu, poskytovať svoje personálne možnosti, priestorové a prístrojové infraštruktúry ústavom a firmám doma či v zahraničí na spoločné projekty.

- 4. Ústav by mal mať oveľa lepšie štruktúrovaný vzťah s medzinárodným poradným výborom (rodové vyváženie popredných odborníkov v danej oblasti) a mať nástroj na implementáciu jeho návrhov a rád.*

Zloženie medzinárodného poradného panelu

Dr. Zoltán Kolláth, Ass. prof, Eotvos Loránd University, Szombathely, Hungary

Dr. Robert Černý, prof, České vysoké učení technické v Praze, Czech Republic

Dr. Arnon Chaipanich, Ass. prof., Chiang Mai University, Thailand

Konzultácie s medzinárodným poradným výborom prebiehajú pravidelne, na základe odporúčania chce vedenie ústavu a VR ÚSTARChu v roku 2023 obnoviť zloženie doplnením tak, aby zodpovedalo koncepciám Ústavu o rodovej rovnosti.

- 5. Medzivládne dohody vyžadujú ambicióznosť a ciele stratégie získavania doktorandov a postdoktorandov zo zahraničia v rámci európskych programov ako aj v rámci štipendijných fondov pridelených vládou SR (SAIA).*

Napriek tomu, že ÚSTARCh je malý ústav - ako uvádza komisia, zreteľne vidno výraznú snahu o rast a internacionalizáciu ústavu. Napríklad v roku 2022 zo SASPRO recipientov ústav získal dvoch renomovaných vedcov, pričom v SAV sú väčšie ústavy, ktoré nezískali ani jedného. Ústav zaznamenáva veľký záujem vedeckých pracovníkov zo zahraničia (aj zo Západu) podieľať sa na jeho vedeckej činnosti. V roku 2023 sa očakáva zapojenie vedcov z Rakúska, Španielska a Iránu. Ústav má každoročne niekoľko zahraničných doktorandov a postdoktorandov v rámci medzivládnych dohôd alebo európskych programov a štipendijných fondov pridelených vládou SR (SAIA). Ústav

prijal dvoch postdoktorandov v rámci programu SASPRO na 3 roky a príchod jedného postdoktoranda z Iránu sa očakáva v roku 2023. Najväčším problémom je vybavovanie víz na veľvyslanectve SR a dlhodobého pobytu na Slovensku. Práve v tejto oblasti apelujeme na pomoc Predsedníctva SAV. Problémom je tiež veľmi nízka finančná podpora zahraničných štážístov na pracovisku v porovnaní s možnosťami podpory v iných krajinách. Napríklad podpora od SAIA pre post doktoranda pod 1000 EUR za mesiac je odradzujúca a vyberie si inú krajinu. Ak nebudeme mať porovnateľnú podporu štážístov s podporou iných krajín, tak záujem spolupracovať so Slovenskom nebude rásť.

Pre skvalitnenie doktorandského štúdia bol analyzovaný súčasný stav a využitie súčasných možností. Rozšírili sa študijné programy a ponúklo sa 9 tém dizertačných prác. Pravidelné hodnotenie doktorandov prebieha na základe vnútorného systému kvality doktorandského štúdia v súlade so študijnými plánmi. V roku 2023 mal ústav 4 doktorandov. Jedna doktorandka úspešne obhájila doktorandskú prácu a získala cenu rektora ako aj ocenenie v súťaži „Študentská osobnosť Slovenska“ v kategórii „Stavebníctvo a architektúra“. Ústav má dvoch garantov doktorandského štúdia v troch programoch: 5.2.8 Stavebné inžinierstvo, 2820 Anorganická technológia a materiály a 2381 Aplikovaná mechanika. V nasledujúcom roku by mal pribudnúť ďalší garant, ktorý v roku 2022 obhájil a získal titul DrSc.

6. *Ústav sa musí viac zapájať do programov EÚ, čo si však vyžaduje aj aktívnu pomoc zo strany SAV pri poskytovaní náležitej podpory pri príprave návrhov, budovaní konzorcia, príprave grantov a písaní návrhov projektov.*

Ústav je pracoviskom základného výskumu so širokým spektrom medzinárodných spoluprac postavených práve na platforme vedeckého bádania.

Ústav stavebníctva a architektúry pravidelne podáva žiadosti o európske projekty v rámci výzvy. V roku 2023 boli podané 3 žiadosti a bol získaný jeden európsky projekt „INTERREG Rebuilt Circular and digital recovery of central Europe construction and building sektor“ v spolupráci so 14 inštitúciami z 8 európskych krajín.

Špičkoví vedeckí pracovníci sa pravidelne zúčastňujú na medzinárodných podujatiach a pôsobia v rôznych medzinárodných vedeckých výboroch:

- International Astronomical Union
- International Solar Energy Society (ISES)
- Optical Society of America (OSA)
- The Illuminating Engineering Society
- ICIC International Committee for Irradiated Concrete
- Central European Assoc. for Computational Mechanics
- International Society for Boundary Elements a pod.

V rámci internacionalizácie naši vedci úzko spolupracujú s mnohými zahraničnými pracoviskami

- Catedras CONACYT, Mexiko
- University Cégep de Sherbrooke, Kanada
- University of Vienna, Rakúsko
- US Army Research Lab, USA,
- Naresuan University, Thailand.
- School of Aerospace, Xi'an Jiaotong University, Xi'an, China
- Materials Sciences and Strength of Materials, University of Stuttgart, Germany
- Queen Mary College University of London, UK
- Imperial College University of London, UK
- Faculty of Mechanical Engineering, Brno University of Technology
- Hubei Key Laboratory of Engineering Structural Analysis and Safety Assessment, Wuhan, China
- Lomonosov University Moscow, Russia

- Department of Mechanical & Aerospace Engineering, Carleton University, Ottawa, Canada
- Department of Civil Engineering, University of Akron, Akron, USA
- Texas Tech University, Lubbock, USA
- National Academy of Sciences of Ukraine,
- Czech Technical University in Prague/Faculty of Civil Engineering
- Centre for Energy Research, Hungarian Academy of Sciences
- Institute of Fundamental Technological Research, Polish Academy of Sciences (IPPT PAN)
- Yonsei University, KR
- VUT Brno, ČR
- Výzkumný ústav stavebních hmot, Brno, ČR

Naši tvoriví pracovníci publikujú v spolupráci so zahraničnými vedcami práce v renomovaných zahraničných periodikách. Cieľom vedenia ústavu je preto plná podpora kvalitných publikačných výstupov s prihliadnutím na impakt faktor daného periodika a zaradenie do kvartilu s najvyšším hodnotením (Q1). Z 41 CC publikácií má ústav tento rok 28 v Q1 (68 %), 10 v Q2 (24 %), 2 v Q3 (5%) a 1 v Q4 (3%) podľa SJR z r. 2021. Teda viac ako 90% všetkých publikácií je v top časopisoch.

*7. Rodová rovnosť v rámci inštitútu si tiež vyžaduje silnú a nepretržitú pozornosť.*

Stratégia rodovej rovnosti na Ústave stavebníctva a architektúry predstavuje súbor cieľov a opatrení, pri ktorých majú ženy a muži, vedkyne a vedci v celej svojej rozmanitosti **slobodu** bádania, rovnaké príležitosti na **úspech** a môžu sa rovnako zúčastňovať na spolupráci, rozhodovaní a **vedení** Ústavu na všetkých úrovniach. Rodová rovnosť nie je len základným ľudským právom, ale aj základným pilierom pre mierové prosperujúce spoločenstvo a udržateľný rozvoj. Chápeme, že ženy majú rovnaké schopnosti ako muži, a teda obidve pohlavia majú mať prístup k rovnakým príležitostiam, zodpovednostiam a aktivitám a majú sa hodnotiť rovnako (rodová rovnosť). Na druhej strane si uvedomujeme, že ženy a muži sú rozdielni a že partikulárne schopnosti a vlastnosti žien by mali byť uznané za rovnako hodnotné ako partikulárne vlastnosti mužov (rodová rovnocennosť). To znamená spravodlivé zaobchádzanie so ženami a mužmi, ale aj zaobchádzanie, ktoré je síce rozdielne, ale zároveň je primerané z hľadiska práv, výhod, povinností a možností. Tieto dva koncepty sa navzájom dopĺňajú, avšak rozdielne správanie, aspirácie a potreby žien a mužov treba uznávať a podporovať rovnakým spôsobom.

### 5.3. Aktualizácia Akčného plánu organizácie v roku 2023

V rámci Akčného plánu sa ústav zameria na

1. Hľadanie konsenzu pre prípadnú integráciu ústavov do väčšieho celku.
2. Aktívne sa zapájať do programov SASPRO a IMPULZ s cieľom získať vysokokvalifikovaných výskumníkov doma i v zahraničí.
3. Akreditácia ďalšieho štúdijského programu doktorandského štúdia.
4. Akvizícia doktorandov a postdoktorandov zo zahraničia v rámci európskych programov, ako aj v rámci poskytovania štipendií vlády SR pre zahraničných študentov
5. Priebežná aktualizácia webovej stránky ústavu v anglickom aj slovenskom jazyku.
6. Dokončiť prípravu kompaktných verzií výročných správ ústavu v anglickom jazyku.
7. Pokračovať v hľadaní riešení pre predaj licencií/patentov pod vedením ústavu
8. Propagácia výsledkov ústavu a špičkových zamestnancov na vedeckých, sociálnych sieťach.
9. Popularizácia výsledkov na internete.
10. Priebežná aktualizácia kritérií hodnotenia tvorivých zamestnancov v súlade s požiadavkami na výkonové financovanie vedeckých pracovísk SAV.
11. Hľadanie konsenzu pri zmene názvu ústavu – súčasný názov má domáce i medzinárodné renomé.

## **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)**

*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: Globálna charakterizácia svetelného znečistenia  
Agentúra a číslo projektu: APVV-18-0014  
Spolupracujúce inštitúcie: Fakulta matematiky, fyziky a informatiky UK  
Kordinátor projektu: Miroslav Kocifaj  
Obdobie riešenia: 1.7.2019-30.6.2023

Názov projektu: Difúzne svetlo v mestskom prostredí: nový model zohľadňujúci vlastnosti lokálnej atmosféry  
Agentúra a číslo projektu: VEGA 2/0010/20  
Spolupracujúce inštitúcie: Fakulta matematiky, fyziky a informatiky UK  
Kordinátor projektu: Miroslav Kocifaj  
Obdobie riešenia: 1.1.2020-31.12.2023

Názov projektu: Výskum priamej zložky dennej osvetlenosti v architektonickom a interiérovom prostredí  
Agentúra a číslo projektu: VEGA 2/0017/20  
Spolupracujúce inštitúcie: SvF TU Košice  
Kordinátor projektu: Stanislav Darula  
Obdobie riešenia: 1. 1. 2020 – 31. 12. 2022

Názov projektu: Štúdium degradácie viaczložkových cementových materiálov v dôsledku uhličitej korózie v podmienkach simulujúcich geotermálne vrty  
Agentúra a číslo projektu: VEGA 2/0032/21  
Spolupracujúce inštitúcie: FCHPT STU, Bratislava  
Kordinátor projektu: Eva Kuzielová  
Obdobie riešenia: 1. 1. 2021 – 31. 12. 2024

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

## **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)**

*Zadávateľ výskumného kontraktu:* Technický a skúšobný ústav stavebný, n. o.

*Názov/účel kontraktového výskumu:* Ortuťová porozimetria - pórová štruktúra mált

*Dobu riešenia:* 10/2022

*Finančný prínos pre organizáciu:* 700 eur

### **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>

### **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

<b>Meno pracovníka</b>	<b>Názov orgánu</b>	<b>Funkcia</b>

### **8.4. Prehľad aktuálnych spoločenských problémov, ktoré riešilo pracovisko v spolupráci s Kanceláriou prezidenta SR, s vládnymi 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	5	tlač	1	TV	0
rozhlas	1	internet	4	exkurzie	1
publikácie	0	multimediálne nosiče	0	dokumentárne filmy	0
iné	0				

### 9.2. Vedecko-organizačná činnosť

Tabuľka 9b Vedecko-organizačná činnosť

Názov podujatia	Domáca/ medzinárodná	Miesto	Dátum konania	Počet účastníkov
CESBP 2022 – Central European Symposium on Building Physics	medzinárodná	Bratislava, SR	5-7. 09. 2022	80
LPTMM 2023 – Light pollution: Theory, modeling and measurement	medzinárodná	Santiago de Compostela, Španielsko	21-24 6. 2022	50

### 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
<b>Spolu</b>			

### 9.5. Členstvo v redakčných radách časopisov

doc. Ing. Stanislav Darula, CSc.

Light and Engineering (funkcia: člen redakčnej rady)  
Lighting Research and Technology (funkcia: člen redakčnej rady)  
VTS News (funkcia: člen redakčnej rady)

Mgr. Olha Hrytsyna, DrSc.

Physico-Mathematical Modelling and Informational Technologies (Ukraine) (funkcia: členka redakčnej rady)

Mgr. Miroslav Kocifaj, DrSc.

Journal of Quantitative Spectroscopy and Radiative Transfer (funkcia: Guest editor)

Remote Sensing (funkcia: Editor { Atmosphere & Urban remote sensing })

Prof.Dr.Ing. Martin-Tchingnabé Palou

Ceramics-Silikaty (funkcia: Editorial Board)

Journal of Thermal Analysis and Calorimetry (funkcia: Editorial Board )

Prof. Ing. Ján Sládek, DrSc.

Electronic Jour. Boundary Elements (funkcia: člen)

Jour. Computational and Applied Mechanics (funkcia: člen)

Journal of Multiscale Modelling (funkcia: člen)

SDHM-Structural Durability and Health Monitoring Journal (funkcia: člen)

Prof. RNDr. Vladimír Sládek, DrSc.

Communications in Numerical Analysis (funkcia: člen redakčnej rady)

Composites Part C (funkcia: člen redakčnej rady)

Int. Jour. Engineering Analysis with Boundary Elements (funkcia: Editor)

Journal of Industrial Mathematics and Computational Mechanics (funkcia: člen redakčnej rady)

## **9.6. Činnosť v domácich vedeckých spoločnostiach**

doc. Ing. Miroslav Čekon, PhD.

Slovenská spoločnosť pre techniku prostredia (SSTP) (funkcia: člen odbornej sekcie OS 16  
Simulácie potrieb energií v budovách)

doc. Ing. Stanislav Darula, CSc.

SNK CIE (funkcia: člen predsedníctva, vedecký tajomník)

SSTP - Slovenská spoločnosť pre techniku prostredia (funkcia: člen)

SSTS-Slovenská svetelnotechnická spoločnosť (funkcia: člen predsedníctva)

ZSVTS (funkcia: člen Rady)

Mgr. Miroslav Kocifaj, DrSc.

CIE Div5, TC 5-28 (funkcia: člen)

Slovenská astronomická spoločnosť (funkcia: člen)

Ing. Peter Matiašovský, CSc.

Slovenská bioklimatologická spoločnosť pri SAV (funkcia: člen)

Slovenská fyzikálna spoločnosť pri SAV (funkcia: člen)

Slovenská spoločnosť pre techniku prostredia (funkcia: člen)

Zväz slovenských vedeckotechnických spoločností (funkcia: Auditor EUR-ACE akreditačného centra ZSVTS)

Prof.Dr.Ing. Martin-Tchingnabé Palou

CO-SM Qualiform s.r.o. (funkcia: člen)  
Technická normalizácia ÚNMS, TK40 (funkcia: Predseda komisie)

Ing. Ladislav Sátor, PhD.

Slovenská spoločnosť pre mechaniku (funkcia: člen)

Prof. Ing. Ján Sládek, DrSc.

Slovenska spoločnosť pre mechaniku (funkcia: člen)

Prof. RNDr. Vladimír Sládek, DrSc.

Slovenská spoločnosť pre mechaniku (funkcia: člen hlav. výboru)

Dr. Stefan Wallner, BSc MSc

Burgenlaendischer Arbeitskreis Astronomie (funkcia: chairman)  
IAU National Outreach Committee Austria (funkcia: Member)

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

## 10. Činnosť knižnično-informačného pracoviska

### 10.1. Knižničný fond

Tabuľka 10a Knižničný fond

<b>Knižničné jednotky spolu</b>		89738
z toho	knihy a zviazané periodiká	79926
	audiovizuálne dokumenty	
	elektronické dokumenty (vrátane digitálnych)	
	mikroformy	
	iné špeciálne dokumenty - dizertácie, výskumné správy	10185
	Rukopisy, vzácne tlače	
Počet titulov dochádzajúcich periodík		2
z toho zahraničné periodiká		2
Ročný prírastok knižničných jednotiek		6
v tom	kúpou	6
	darom	
	výmenou	
	bezodplatným prevodom	
	náhradou	
Úbytky knižničných jednotiek		
Knižničné jednotky spracované automatizovane		

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

<b>Výpožičky spolu (riadok 1)</b>		344
v tom z r. 1	prezenčné výpožičky	23
	absenčné výpožičky	321
v tom z r. 1	odborná literatúra pre dospelých	316
	výpožičky periodík	28
MVS iným knižniciam		2
MVS z iných knižníc		10
MMVS iným knižniciam		1

MMVS z iných knižníc	
Počet vypracovaných bibliografií	
Počet vypracovaných rešerší	

### 10.3. Používatelia

Tabuľka 10c Používatelia

Registrovaní používatelia	42
Návštevníci knižnice spolu (bez návštevníkov podujatí)	65

### 10.4. Iné údaje

Tabuľka 10d Iné údaje

On-line katalóg knižnice na internete ( 1=áno, 0=nie)	0
Náklady na nákup knižničného fondu v €	519.23

### 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

### 11.4. Členstvo v orgánoch VEGA

Mgr. Miroslav Kocifaj, DrSc.

- komisia č. 6 pre stavebné inžinierstvo (stavebníctvo, dopravu a geodéziu) a environmentálne inžinierstvo vrátane baníctva, hutníctva a vodohospodárskych vied (člen)

RNDr. Ladislav Kómar, PhD.

- komisia č. 6 pre stavebné inžinierstvo (stavebníctvo, dopravu a geodéziu) a environmentálne inžinierstvo vrátane baníctva, hutníctva a vodohospodárskych vied (člen)

Ing. Eva Kuzielová, PhD.

- komisia č. 6 pre stavebné inžinierstvo (stavebníctvo, dopravu a geodéziu) a environmentálne inžinierstvo vrátane baníctva, hutníctva a vodohospodárskych vied (člen)

Prof. RNDr. Vladimír Sládek, DrSc.

- komisia č.6 pre stavebné inžinierstvo (stavebníctvo, dopravu a geodéziu) a environmentálne inžinierstvo vrátane baníctva a vodohospodárskych vied (člen)

Ing. Miroslav Repka, PhD.

- komisia č.6 pre stavebné inžinierstvo (stavebníctvo, dopravu a geodéziu) a environmentálne inžinierstvo vrátane baníctva a vodohospodárskych vied (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>	1 314 708	1 015 918	177 958	120 832	77,27
z toho: mzdy (610)	801 453	705 929	79 220	16 304	88,08
vedecká výchova štipendiá (640)	32 005	32 005	0	0	100
poistné a príspevok do poisťovní (620)	263 077	211 407	27 169	24 501	80,35
tovary a služby (630)	186 266	66 577	55 806	63 883	35,74
transfery partnerom projektov (640)	15 763	0	15 763	0	0
<b>2. Kapitálové výdavky</b>	2 510	2 500	0	10	99,6
z toho: obstarávanie kapitálových aktív	2 510	2 500	0	10	99,6
kapitálové transfery	0	0	0	0	0

### 12.2. Zdroje financovania organizácie

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

Typ organizácie (v. v. i.)	Z toho kategórie				
Zdroje	Spolu	Kapitálové zdroje	zdroje na mzdy (610)	zdroje na odvody do poisťovní (620)	zdroje na transfery partnerom projektov
<b>1. kapitola SAV (111)</b>	1 022 418	2 500	705 929	211 407	0
z toho: VEGA	44 102	2 500	0	0	0
MVTS výskumné projekty	0	0	0	0	0
MVTS podpora	0	0	0	0	0
SASPRO/MOREPRO	22 831	0	9 342	3 288	0
Vydávanie časopisov	0	0	0	0	0
Vedeká výchova (štipendiá)	32 005	0	0	0	0

OTAS (630)	17 335	0	0	0	0
<b>2. ŠF EÚ vr. fin. zo ŠR</b>	0	0	0	0	0
<b>3. medzinárodné grantové projekty</b>	21 920	0	16 213	5 707	0
z toho: H2020	0	0	0	0	0
<b>4. iné štátne a verejné zdroje (spolu)</b>	180 368	0	79 220	27 169	15 763
z toho: APVV	180 368	0	79 220	27 169	15 763
podpora z kapitoly MŠVVaŠ SR (stimuly)	0	0	0	0	0
<b>5. ostatné zdroje</b>	120 140	10	281	18 888	0
z toho: príjmy z prenájmu	60 213	0	0	0	0
príjmy z podnikateľskej činnosti	0	0	0	0	0
príjmy z expertnej činnosti a služieb	59 927	10	281	18 888	0



### **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 súlade s princípmi rodovej rovnosti a ustanoveniami Etického kódexu SAV nerobí vedenie ústavu žiadne rozdiely pri pracovnej náplni, kariérom raste, či odmeňovaní pracovníkov na základe rodového rozdielu. Zohľadňujú sa v plnej miere predpisy BOZP pri plnení pracovných povinností samostatne u žien a u mužov (napr. dvíhanie bremien).

Plán rodovej rovnosti je postavený na audite súčasného stavu zamestnancov a ich zaradenia podľa vybraných kvantitatívnych a kvalitatívnych ukazovateľov.

Rodová štruktúra pracovníkov ústavu je nasledovná:

- Vedúci oddelení: 50 % mužov a 50 % žien
- THS: 86 % žien a 14% mužov
- Oddelenie aplikovanej mechaniky: 87,5% mužov a 12,5 % žien
- Oddelenie optiky a termofyziky: 91 % mužov a 9% žien
- Oddelenie materiálov a konštrukcií: 66% mužov a 34% žien
- Vedenie Ústavu: 60% mužov a 40% žien
- Doktorandské štúdium: 25% mužov a 75% žien

Z hľadiska rodovej skladby je na ústave zamestnaných 29 mužov a 16 žien, z toho VŠ pracovníkov je 24 mužov a 9 žien. Z tvorivých pracovníkov je jedna žena s titulom DrSc., jedna v kvalifikačnom stupni IIa a tri interné doktorandky. Z hlavných riešiteľov projektov je iba jedna žena, čo súvisí aj s vekovým zložením pracovníkov ústavu, nakoľko veková kategória 40-60 rokov, ktorá je nositeľom ideí a hlavným žiadateľom o projekty, je na ústave slabo zastúpená.

### 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>	6	5	1	0	0	0
<b>2. Projekty APVV</b>	4	4	0	0	0	0
<b>3. Projekty EŠIF/OP ŠF</b>	0	0	0	0	0	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>	0	0	0	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	0	0	0
<b>2. Projekty ERA.NET, ESA, JRP</b>	0	0	0	0	0	0
<b>3. Projekty COST</b>	0	0	0	0	0	0
<b>4. Projekty EUREKA, NATO, UNESCO, CERN, IAEA, IVF, ERDF a iné</b>	0	0	0	0	0	0
<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>	0	0	0	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

Stratégia rodovej rovnosti na roky sa zameria na týchto 4 strategických oblastí:

1. Opatrenia proti rodovo podmienenému šikanovaniu, násiliu a sexuálnemu obťažovaniu.
2. Usilovať sa o pomerné alebo vyvážené rodové zastúpenie na verejnom rozhodovaní (Vedecká rada, Správna rada a pod.)
3. Vytvoriť podmienky pre rovnováhu medzi pracovným a rodinným životom, vrátane podpory využívania jasieľ a materských škôl, športových štruktúr a športových podujatí, spoločenských aktivít.
4. Začlenenie partikulárnosti rodových vlastností do služieb Ústavu (popularizácie, výskumu a vyučovania).

### **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**

#### **16.1.2. Iné domáce ocenenia**

### **16.2. Medzinárodné ocenenia**

**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. Ladislav Kómar, PhD.

**Riaditeľ organizácie SAV**

**Predseda vedeckej rady**

.....  
Prof.Dr.Ing. Martin-Tchingnabé Palou

.....  
Mgr. Miroslav Kocifaj, DrSc.

## Prílohy

### Príloha A

#### Zoznam zamestnancov a doktorandov organizácie k 31.12.2022

##### Zoznam zamestnancov podľa štruktúry

	Meno s titulmi	Úväzok (v %)	Ročný prepočítaný úväzok
<b>Vedúci vedeckí pracovníci DrSc.</b>			
1.	Mgr. Miroslav Kocifaj, DrSc.	100	1.00
2.	Prof. Ing. Ján Sládek, DrSc.	100	1.00
3.	Prof. RNDr. Vladimír Sládek, DrSc.	100	1.00
<b>Vedúci vedeckí pracovníci CSc., PhD.</b>			
1.	Prof.Dr.Ing. Martin-Tchingnabé Palou	100	1.00
<b>Samostatní vedeckí pracovníci</b>			
1.	doc. Ing. Miroslav Čekon, PhD.	50	0.50
2.	doc. Ing. Stanislav Darula, CSc.	100	1.00
3.	RNDr. Ladislav Kómar, PhD.	100	1.00
4.	Ing. Eva Kuzielová, PhD.	100	1.00
5.	Ing. Peter Matiašovský, CSc.	100	1.00
6.	Mgr. Jaromír Petržala, PhD.	100	1.00
7.	Ing. Tomáš Profant, Doc.,PhD.	50	0.50
8.	Ing. Miroslav Repka, PhD.	100	1.00
9.	Ing. Ladislav Sátor, PhD.	100	1.00
<b>Vedeckí pracovníci</b>			
1.	Ing. Jakub Čurpek, PhD.	50	0.50
2.	Mgr. Olha Hrytsyna, DrSc.	100	1.00
3.	Ing. Jozef Kriváček, CSc.	20	0.20
4.	Ing. Michal Slaný, PhD.	40	0.40
5.	Ing. Richard Slávik, PhD.	50	0.50
6.	Mgr. Hector Antonio Solano Lamphar, PhD.	50	0.50
7.	Dr. Kai Pong Tong	100	1.00
8.	Mgr. Ajitanshu Vedrtam	100	0.33
9.	Dr. Stefan Wallner, BSc MSc	100	0.73
10.	Ing. Matúš Žemlička, PhD.	100	1.00
<b>Odborní pracovníci s VŠ vzdelaním (výskumní a vývojoví zamestnanci)</b>			

1.	Ing. Kristína Compeľová	20	0.08
2.	Ing. Jana Čepčianska	30	0.30
3.	Mgr. Stanislav Fecko	50	0.50
4.	Mgr. Maryan Hrytsyna	100	1.00
5.	RNDr. Anna Kocifajová	100	1.00
6.	Ing. Peter Mihálka, PhD.,	50	0.50
7.	Ing. Marián Vrabec	100	1.00
<b>Odborní pracovníci s VŠ vzdelaním (ostatní zamestnanci)</b>			
1.	Bc., Ing. Mária Lindorová	20	0.20
2.	Mgr. Renata Miklošová	100	1.00
3.	Mgr. Dagmar Práznovská	80	0.80
4.	Ing. Danko Sitarčíková	80	0.80
<b>Odborní pracovníci ÚSV</b>			
1.	Silvia Bučičová	100	1.00
2.	Martin Habovštiak	100	1.00
3.	Katarína Jakubove	100	1.00
4.	Roman Kralovič	100	1.00
5.	Anna Rajnohová	100	1.00
6.	Dagmar Slámová	100	1.00
<b>Ostatní pracovníci</b>			
1.	Eva Janotová	80	0.80
2.	Karol Kasák	100	1.00
3.	Jozef Kováč	80	0.80
4.	Rudolf Maninka	100	1.00
5.	Lucia Pinkavová	100	1.00

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

	Meno s titulmi	Dátum odchodu	Ročný prepočítaný úväzok
<b>Odborní pracovníci s VŠ vzdelaním (výskumní a vývojoví zamestnanci)</b>			
1.	Ing. Janette Podhorská	31.8.2022	0.08
<b>Ostatní pracovníci</b>			
1.	Pavol Krchňák	16.9.2022	0.30

**Zoznam doktorandov**

	Meno s titulmi	Škola/fakulta	Študijný odbor
<b>Interní doktorandi hrazení z prostriedkov SAV</b>			
1.	Ing. Kristína Compeľová	Fakulta chemickej a potravinárskej technológie STU	2820 anorganická technológia a materiály
2.	Ing. Peter Czirák	Stavebná fakulta STU	3659 stavebníctvo
3.	Ing. Jana Čepčianska	Stavebná fakulta STU	3659 stavebníctvo
4.	Ing. Janette Podhorská	Stavebná fakulta STU	3659 stavebníctvo
<b>Interní doktorandi hrazení z iných zdrojov</b>			
<i>organizácia nemá interných doktorandov hrazených z iných zdrojov</i>			
<b>Externí doktorandi</b>			
<i>organizácia nemá externých doktorandov</i>			

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

	Meno s titulmi	Dátum obhajoby	Dátum prijatia	Úväzok (v %)
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**Zoznam emeritných vedeckých zamestnancov**

	Meno s titulmi
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## **Príloha B**

### **Projekty riešené v organizácii**

#### **Medzinárodné projekty**

#### **Domáce projekty**

#### **Programy: VEGA**

##### **1.) Výskum priamej zložky dennej osvetlenosti v architektonickom a interiérovom prostredí** *(Research of direct component of daylighting in architectural and interior environment)*

**Zodpovedný riešiteľ:** Stanislav Darula  
**Trvanie projektu:** 1.1.2020 / 31.12.2022  
**Evidenčné číslo projektu:** VEGA- 2/0017/20  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Ústav stavebníctva a architektúry SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** VEGA SAV: 2182 €

##### Dosiahnuté výsledky:

BIZOŇOVÁ, Silvia - PONECHAL, Radoslav\*\* - DARULA, Stanislav - JURÁŠ, Peter. Methods of preliminary estimation of total solar energy transmittance (TSET) on a sun protected window with climatic chamber and hot box apparatus. In Civil and Environmental Engineering, 2022, vol. 18, no. 1, p. 269-279. (2021: 0.268 - SJR, Q3 - SJR). ISSN 1336-5835. Dostupné na: <https://doi.org/10.2478/cee-2022-0025> (2/0017/20 : Výskum priamej zložky dennej osvetlenosti v architektonickom a interiérovom prostredí) Typ: ADNB

KITTLER, Richard\*\* - DARULA, Stanislav. Redistributions of luminance patterns on standard sky types. In Lighting Research and Technology, 2022, vol. 54, p. 61-73. (2021: 2.680 - IF, Q2 - JCR, 0.692 - SJR, Q2 - SJR). ISSN 1477-1535. Dostupné na: <https://doi.org/10.1177/14771535211015507> (APVV 0118-12 : Simulovanie denného svetla v umelej oblohe. 2/0017/20 : Výskum priamej zložky dennej osvetlenosti v architektonickom a interiérovom prostredí) Typ: ADCA

##### **2.) Difúzne svetlo v mestskom prostredí: nový model zohľadňujúci vlastnosti lokálnej atmosféry** *(Diffuse light in urban environment: A new model which embraces the optical properties of a local urban atmosphere)*

**Zodpovedný riešiteľ:** Miroslav Kocifaj  
**Trvanie projektu:** 1.1.2020 / 31.12.2023  
**Evidenčné číslo projektu:** DIFFUSE  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Ústav stavebníctva a architektúry SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** VEGA SAV: 9634 €

Dosiahnuté výsledky:

GUEYMARD, CH. A. - KOCIFAJ, Miroslav\*\*. Clear-sky spectral radiance modeling under variable aerosol conditions. In Renewable and Sustainable Energy Reviews, 2022, vol. 168, art. no. 112901. (2021: 16.799 - IF, Q1 - JCR, 3.678 - SJR, Q1 - SJR). ISSN 1364-0321. Dostupné na: <https://doi.org/10.1016/j.rser.2022.112901>

KOCIFAJ, Miroslav - BARÁ, Salvador - FALCHI, F. Towards a global map of the artificial all-sky brightness. In Monthly Notices of the Royal Astronomical Society: Letters, 2022, vol. 513, no. 1, p. L25–L29. (2021: 1.705 - SJR, Q1 - SJR). ISSN 1745-3925. Dostupné na: <https://doi.org/10.1093/mnrasl/slac029>

KOCIFAJ, Miroslav - KUNDRACIK, F. - BARÁ, Salvador - BARENTINE, John C. - WALLNER, Stefan. Nighttime Atmospheric Scattering Phase Function Derived From the Scattered Light of a Laser Beam. In Geophysical Research Letters, 2022, vol. 49, art. no. e2022GL098608. (2021: 5.576 - IF, Q1 - JCR, 1.857 - SJR, Q1 - SJR). ISSN 0094-8276. Dostupné na: <https://doi.org/10.1029/2022GL098608>

KÓMAR, Ladislav - WALLNER, Stefan - KOCIFAJ, Miroslav. The significant impact of shape deviations of atmospheric aerosols on light monitoring networks. In Monthly Notices of the Royal Astronomical Society, 2022, vol. 512, p. 1805-1813. (2021: 5.235 - IF, Q1 - JCR, 1.678 - SJR, Q1 - SJR, karentované - CCC). (2022 - Current Contents, WOS, SCOPUS, NASA ADS). ISSN 0035-8711. Dostupné na: <https://doi.org/10.1093/mnras/stac548>

**3.) Výskum energetickej účinnosti inovatívnych BIPV/T článkov chladených PCM technológiou.** (*The energy efficiency of an innovative BIPV/TE-PCM module with PCM passive cooling*)

<b>Zodpovedný riešiteľ:</b>	Ladislav Kómar
<b>Trvanie projektu:</b>	1.1.2020 / 31.12.2023
<b>Evidenčné číslo projektu:</b>	2/0095/20
<b>Organizácia je koordinátorom projektu:</b>	áno
<b>Koordinátor:</b>	Ústav stavebníctva a architektúry SAV, v. v. i.
<b>Počet spoluriešiteľských inštitúcií:</b>	0
<b>Čerpané financie:</b>	VEGA SAV: 5672 €

Dosiahnuté výsledky:

MIHÁLKA, Peter\*\* - MATIAŠOVSKÝ, Peter. Correlation Between External Boundary Conditions and Convective Heat Transfer at Vertical PV Panel. In AIP Conference Proceedings, 2022, vol. 2488, art. no. 020015, 6 p. (2021: 0.189 - SJR). ISSN 0094-243X. Dostupné na: <https://doi.org/10.1063/5.0100355> (VEGA 2/0095/20 : Výskum energetickej účinnosti inovatívnych BIPV/T článkov chladených PCM technológiou)

**4.) Štúdium degradácie viaczložkových cementových materiálov v dôsledku uhlíčitej korózie v podmienkach simulujúcich geotermálne vrty** (*Study of multicomponent cement material degradation under conditions simulating CO2 enriched geothermal environment*)

<b>Zodpovedný riešiteľ:</b>	Eva Kuzielová
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**Trvanie projektu:** 1.1.2021 / 31.12.2024  
**Evidenčné číslo projektu:** 2/0032/21  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Ústav stavebníctva a architektúry SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** VEGA SAV: 6544 €

Dosiahnuté výsledky:

KUZIELOVÁ, Eva – SLANÝ, Michal – ŽEMLIČKA, Matúš – MÁSILKO, Jiří – ŠILER, Pavel – PALOU, Martin T.. Thermal stability of the phases developed at high-pressure hydrothermal curing of class G cement with different pozzolanic and latent hydraulic additives. In *Journal of Thermal Analysis and Calorimetry*, 2022, vol. 147, no. 18, p. 9891-9902. Typ: ADCA

PALOU, Martin T. – NOVOTNÝ, Radoslav – KUZIELOVÁ, Eva – ŽEMLIČKA, Matúš – ČEPČIANSKA, Jana – PODHORSKÁ, Janette. The influence of supplementary cementitious materials on the hydration of Dyckerhoff G-Oil cement. In *Journal of Thermal Analysis and Calorimetry*, 2022, vol. 147, no. 18, p. 9935-9948. Typ: ADCA

COMPELOVÁ, Kristína – KUZIELOVÁ, Eva – ŽEMLIČKA, Matúš – MÁSILKO, Jiří – PALOU, Martin T.. Karbonatizácia zmesových cementových spojív s prídavkom kremičitého úletu a metakaolínu. In *Kvalita cementu 2022 : XV. ročník odborného seminára Výskumného ústavu stavebných hmot*, 13. – 14. 6. 2022, Mikulov. Lektorovali: René Čechmánek, Martin Nejedlík. – *Výskumný ústav stavebných hmot*, 2022, s. 29-35. Typ: AFC

COMPELOVÁ, Kristína – KUZIELOVÁ, Eva. Vplyv hydrotermálnych podmienok na vlastnosti cementových spojív. In *SILITECH 2022 – X. celoštátny odborný seminár : zborník príspevkov.* – Bratislava : Slovenská technická univerzita v Bratislave, 2022, s. 23-29. ISBN 978-80-227-5219-0. Typ: AFD

HAJDÚCHOVÁ, Z. – KUZIELOVÁ, Eva – ŽEMLIČKA, Matúš – SLANÝ, Michal. Urýchlená karbonatizácia viacložkových cementových zmesí. In *SILITECH 2022 – X. celoštátny odborný seminár : zborník príspevkov.* – Bratislava : Slovenská technická univerzita v Bratislave, 2022, s. 35-40. ISBN 978-80-227-5219-0. Typ: AFD

HAJDÚCHOVÁ, Z. – KUZIELOVÁ, Eva – SLANÝ, Michal – ŽEMLIČKA, Matúš. Structure of high-temperature phases in the multicomponent cement pastes studied by infrared spectroscopy in the mid-ir region. In *Czech Chemical Society Symposium Series*, 2022, roč. 20, č. 4, s. 284. ISSN 2336-7202. Typ: AFK

KUZIELOVÁ, Eva – TATARKO, Miroslav – SLANÝ, Michal – ŽEMLIČKA, Matúš – MÁSILKO, Jiří – NOVOTNÝ, Radoslav – PALOU, Martin T.. Influence of geothermal water and increased temperature on early and middle stages of hydration of multicomponent cement systems. In *CEEC-PCMS1. 1st Central and Eastern European Conference on Physical Chemistry and Materials Science*, 26-30 July 2022, Split, Croatia : book of abstracts. – Central and Eastern European Committee for Thermal Analysis and Calorimetry (CEEC-TAC), 2022, p. 131. ISBN 978-606-11-8164-3. Typ: AFG

KUZIELOVÁ, Eva – JURIŠOVÁ, Jana – NOVOTNÝ, Radoslav – ŽEMLIČKA, Matúš. Factors influencing the hydration course of blended cement under conditions simulating real geothermal wells in Slovakia. In *Czech Chemical Society Symposium Series*, 2022, roč. 20, č. 4, s. 284. ISSN 2336-7202. Typ: AFK

E. Kuzielová, M. Tatarko, M. Slaný, et al. Early and middle stages of multicomponent cement hydration under the effect of geothermal water and increased temperatures. *Geothermics*. 2023; <https://doi.org/10.1016/j.geothermics.2022.102632> Typ: ADCA

**5.) Materiálové zloženie a vlastnosti samozhutniteľných ťažkých betónov (*Material***

*composition and properties of Self-Compacting Heavyweight Concrete)*

**Zodpovedný riešiteľ:** Martin-Tchingnabé Palou  
**Trvanie projektu:** 1.1.2021 / 31.12.2023  
**Evidenčné číslo projektu:** VEGA 2/0017/21  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Ústav stavebníctva a architektúry SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** VEGA SAV: 6981 €

Dosiahnuté výsledky:

Na základe predošlých výskumov v oblasti ťažkých betónov boli pripravené vzorky za použitia dvoch ťažkých kamenív s vysokou objemovou hmotnosťou, portlandského cementu a SCMs. Analýza chemického zloženia plniva aj spojiva bola realizovaná pomocou troch metód a to NAA, PGAA a XRF. Z výsledkov fyzikálno-mechanických vlastností vzoriek je zrejmé, že vzorky po 28 dňoch dosiahli triedu pevnosti betónu C55/67. Hodnoty objemovej hmotnosti betónu sa zisťovali v čerstvom aj v zatvrdnutom stave a značne presahujú 3000 kg m<sup>-3</sup>. Ostatné sledované vlastnosti preukazujú, že tieto betóny je možné označiť za vysoko-pevnostné ťažké betóny. Rovnako použité materiály preukázali dobré aktivačné vlastnosti.

1. PODHORSKÁ, Janette - PALOU, Martin T. Verification of the Physical and Mechanical Properties of the Heavyweight Concrete Used in the Shielding Construction of Reactor Casing at the Nuclear Power Plant. In Materials Science Forum, 2022, vol. 1070, p. 223-229. (2021: 0.211 - SJR, Q3 - SJR). ISSN 0255-5476. Dostupné na: <https://doi.org/10.4028/p-4nulnu>.

2. PALOU, Martin T. - NOVOTNÝ, Radoslav - KUZIELOVÁ, Eva - ŽEMLIČKA, Matúš - ČEPČIANSKA, Jana - PODHORSKÁ, Janette. The influence of supplementary cementitious materials on the hydration of Dyckerhoff G-Oil cement. In Journal of Thermal Analysis and Calorimetry, 2022, vol. 147, no. 18, p. 9935-9948. (2021: 4.755 - IF, Q1 - JCR, 0.639 - SJR, Q2 - SJR). ISSN 1388-6150. Dostupné na: <https://doi.org/10.1007/s10973-022-11444-y>

3. KUZIELOVÁ, Eva - SLANÝ, Michal - ŽEMLIČKA, Matúš - MÁŠILKO, Jiří - ŠILER, Pavel - PALOU, Martin T. Thermal stability of the phases developed at high-pressure hydrothermal curing of class G cement with different pozzolanic and latent hydraulic additives. In Journal of Thermal Analysis and Calorimetry, 2022, vol. 147, no. 18, p. 9891-9902. (2021: 4.755 - IF, Q1 - JCR, 0.639 - SJR, Q2 - SJR). ISSN 1388-6150. Dostupné na: <https://doi.org/10.1007/s10973-022-11254-2>.

**6.) Multiškálové štúdium a modelovanie kompozitných makrokonštrukcií** (*Multiscale study and modelling of composite macrostructures*)

**Zodpovedný riešiteľ:** Vladimír Sládek  
**Trvanie projektu:** 1.1.2020 / 31.12.2023  
**Evidenčné číslo projektu:** 2/0061/20  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Ústav stavebníctva a architektúry SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** VEGA SAV: 13089 €

Dosiahnuté výsledky:



1. J. Sladek, V. Sladek, X. Tian, Q. Deng: Mixed FEM for flexoelectric effect analyses in a viscoelastic material, *Int. Journal of Solids and Structures* 234-235 (2022), 111269  
<https://doi.org/10.1016/j.ijsolstr.2021.111269>
2. X. Tian, M. Xu, H. Zhou, Q. Deng, Q. Li, J. Sladek, V. Sladek: Analytical studies on mode III fracture in flexoelectric solids, *Journal of Applied Mechanics* 89 (2022), art. 041006-1.  
<https://doi.org/10.1115/1.4053268>
3. P.H. Wen, J.C. Wen, J. Sladek, V. Sladek: Stress intensity factors and T-stresses for periodic array cracks: 3D static and dynamic. *Theoretical and Applied Fracture Mechanics*, 117 (2022) 103198. <https://doi.org/10.1016/j.tafmec.2021.103198>
4. W. Huang, J. Yang, J. Sladek, V. Sladek, P. Wen: Semi-infinite structure analysis with bimodular materials with infinite element, *Materials* 15 (2022), 641. <https://doi.org/10.3390/ma15020641>, <https://www.mdpi.com/1996-1944/15/2/641/pdf>
5. J. Sladek, V. Sladek, M. Repka, E. Pan: Size effect in piezoelectric semiconductor nanostructures, *Jour. of Intelligent Materials and Structures* 33 (2022), 1351-1363.  
<https://doi.org/10.1177/1045389X211053049>
6. L. Sator, V. Sladek, J. Sladek: A strong form meshless method for the solution of FGM plates, *Aerospace* 9 (2022), 425 <https://www.mdpi.com/2226-4310/9/8/425/pdf>
7. O. Hrytsyna, J. Sladek, V. Sladek, M. Hrytsyna: Love waves propagation in layered waveguide structures including flexomagnetism/flexoelectricity and micro-inertia effects, *Mech Adv. Mater. Struct.*
8. J. Sladek, V. Sladek, M. Hrytsyna, T. Profant: Application of the gradient theory to interface crack between two dissimilar dielectric materials, *Eng. Fract. Mech.* 276 (2022), 108895.  
<https://doi.org/10.1016/j.engfracmech.2022.108895>
9. T. Profant, J. Sladek, V. Sladek, M. Kotoul: Asymptotic solution for interface crack between two materials governed by dipolar gradient elasticity: Amplitude factor evaluation, *Theoret. Appl. Fract. Mech.* 120 (2022), 103378. <https://doi.org/10.1016/j.tafmec.2022.103378>
10. J. Sladek, V. Sladek, M. Hrytsyna, T. Profant: Influence of flexoelectricity on an interface crack between two dissimilar dielectric materials, *Procedia Structural Integrity* 42 (2022) 1584-1590.  
<https://www.sciencedirect.com/science/article/pii/S2452321622007570>

## Programy: APVV

### 7.) Globálna charakterizácia svetelného znečistenia (*Global Characterization of Skyglow*)

<b>Zodpovedný riešiteľ:</b>	Miroslav Kocifaj
<b>Trvanie projektu:</b>	1.7.2019 / 30.6.2023
<b>Evidenčné číslo projektu:</b>	APVV-18-0014
<b>Organizácia je koordinátorom projektu:</b>	áno
<b>Koordinátor:</b>	Ústav stavebníctva a architektúry SAV, v. v. i.
<b>Počet spoluriešiteľských inštitúcií:</b>	0
<b>Čerpané financie:</b>	APVV: 41466 €

#### Dosiahnuté výsledky:

BARÁ, Salvador - PEREZ-COUTO, Xabier - FALCHI, F. - KOCIFAJ, Miroslav - MASANA, Eduard. Estimating linear radiance indicators from the zenith night-sky brightness: on the Posch ratio for natural and light-polluted skies. In *Monthly Notices of the Royal Astronomical Society*,

2022, vol. 512, no. 2, p. 2125-2134.

GUEYMARD, CH. A. - KOCIFAJ, Miroslav\*\*. Clear-sky spectral radiance modeling under variable aerosol conditions. In *Renewable and Sustainable Energy Reviews*, 2022, vol. 168, art. no. 112901. (2021: 16.799 - IF, Q1 - JCR, 3.678 - SJR, Q1 - SJR). ISSN 1364-0321. Dostupné na: <https://doi.org/10.1016/j.rser.2022.112901>

KOCIFAJ, Miroslav\*\* - BARÁ, Salvador. Diffuse light around cities: New perspectives in satellite remote sensing of nighttime aerosols. In *Atmospheric Research*, 2022, vol. 266, art. no. 105969. (2021: 5.965 - IF, Q1 - JCR, 1.386 - SJR, Q1 - SJR). ISSN 0169-8095. Dostupné na: <https://doi.org/10.1016/j.atmosres.2021.105969>

KOCIFAJ, Miroslav - BARÁ, Salvador - FALCHI, F. Towards a global map of the artificial all-sky brightness. In *Monthly Notices of the Royal Astronomical Society: Letters*, 2022, vol. 513, no. 1, p. L25–L29. (2021: 1.705 - SJR, Q1 - SJR). ISSN 1745-3925. Dostupné na: <https://doi.org/10.1093/mnrasl/slac029>

KOCIFAJ, Miroslav - KUNDRACIK, F. - BARÁ, Salvador - BARENTINE, John C. - WALLNER, Stefan. Nighttime Atmospheric Scattering Phase Function Derived From the Scattered Light of a Laser Beam. In *Geophysical Research Letters*, 2022, vol. 49, art. no. e2022GL098608. (2021: 5.576 - IF, Q1 - JCR, 1.857 - SJR, Q1 - SJR). ISSN 0094-8276. Dostupné na: <https://doi.org/10.1029/2022GL098608>

KÓMAR, Ladislav - WALLNER, Stefan - KOCIFAJ, Miroslav. The significant impact of shape deviations of atmospheric aerosols on light monitoring networks. In *Monthly Notices of the Royal Astronomical Society*, 2022, vol. 512, p. 1805-1813. (2021: 5.235 - IF, Q1 - JCR, 1.678 - SJR, Q1 - SJR, karentované - CCC). (2022 - Current Contents, WOS, SCOPUS, NASA ADS). ISSN 0035-8711. Dostupné na: <https://doi.org/10.1093/mnras/stac548>

KYBA, Christopher C. M. - AUBÉ, Martin - BARÁ, Salvador - BERTOLO, Andrea - BOUROUSSIS, Constantinos A. - CAVAZZANI, Stefano - ESPEY, Brian R. - FALCHI, F. - GYUK, Geza - JECHOW, Andreas - KOCIFAJ, Miroslav - KOLLÁTH, Zoltán - SOLANO LAMPHAR, H. A. - LEVIN, Noam - LIU, Shengjie - MILLER, Steven D. - ORTOLANI, Sergio - PUN, Chun Shing Jason - RIBAS, Salvador J. - RUHTZ, Thomas - SANCHEZ DE MIGUEL, A. - SCHNEIDER, Mathias - SHRESTHA, Ranjay Man - SIMONEAU, Alexandre - SO, Chu Wing - STORCH, Tobias - TONG, Kai Pong - TUNON, Milagros - TURNSHEK, Diane - WALCZAK, Ken - WANG, Jun - WANG, Zhuosen - ZHANG, Jianglong. Multiple Angle Observations Would Benefit Visible Band Remote Sensing Using Night Lights. In *Journal of Geophysical Research - Atmospheres*, 2022, vol. 127, art. no. e2021JD036382. (2021: 5.217 - IF, Q1 - JCR, 1.796 - SJR, Q1 - SJR). ISSN 2169-897X. Dostupné na: <https://doi.org/10.1029/2021JD036382>

SOLANO LAMPHAR, H. A. - KOCIFAJ, Miroslav - LIMON-ROMERO, Jorge - PAREDES-TAVARES, Jorge - MEGO, Michal - PRADO, Natalia Jorgelina - BAEZ-LOPEZ, Yolanda Angelica - DIEZ, Emiliano Raul\*\*. Light pollution as a factor in breast and prostate cancer. In *Science of the Total Environment*, 2022, vol. 806, art. no. 150918. (2021: 10.753 - IF, Q1 - JCR, 1.806 - SJR, Q1 - SJR). ISSN 0048-9697. Dostupné na: <https://doi.org/10.1016/j.scitotenv.2021.150918>

SOLANO LAMPHAR, H. A.\* - WALLNER, Stefan\* - KOCIFAJ, Miroslav. Modelled impacts of a potential light emitting diode lighting system conversion and the influence of an extremely polluted atmosphere in Mexico City. In *Environment and Planning B-Urban Analytics and City*

Science, 2022, vol. 49, p. 501-518. (2021: 3.511 - IF, Q2 - JCR, 1.006 - SJR, Q1 - SJR). ISSN 2399-8083. Dostupné na: <https://doi.org/10.1177/23998083211012702>

**8.) Výskum a vývoj mnohozložkových cementových zmesí pre špeciálne konštrukčné materiály** (*Research and development of multi-component cementitious blends for special construction materials*)

**Zodpovedný riešiteľ:** Martin-Tchingnabé Palou  
**Trvanie projektu:** 1.7.2020 / 30.6.2024  
**Evidenčné číslo projektu:** APVV-19-0490  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Ústav stavebníctva a architektúry SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** APVV: 55085 €

Dosiahnuté výsledky:

- 1.PALOU, Martin T. - NOVOTNÝ, Radoslav - KUZIELOVÁ, Eva - ŽEMLIČKA, Matúš - ČEPČIANSKA, Jana - PODHORSKÁ, Janette. The influence of supplementary cementitious materials on the hydration of Dyckerhoff G-Oil cement. In Journal of Thermal Analysis and Calorimetry, 2022, vol. 147, no. 18, p. 9935-9948. (2021: 4.755 - IF, Q1 - JCR, 0.639 - SJR, Q2 - SJR). ISSN 1388-6150. Dostupné na: <https://doi.org/10.1007/s10973-022-11444-y>
- 2.PODHORSKÁ, Janette - PALOU, Martin T. Verification of the Physical and Mechanical Properties of the Heavyweight Concrete Used in the Shielding Construction of Reactor Casing at the Nuclear Power Plant. In Materials Science Forum, 2022, vol. 1070, p. 223-229. (2021: 0.211 - SJR, Q3 - SJR). ISSN 0255-5476. Dostupné na: <https://doi.org/10.4028/p-4nulu>.
- 3.KUZIELOVÁ, Eva - SLANÝ, Michal - ŽEMLIČKA, Matúš - MÁŠILKO, Jiří - ŠILER, Pavel - PALOU, Martin T. Thermal stability of the phases developed at high-pressure hydrothermal curing of class G cement with different pozzolanic and latent hydraulic additives. In Journal of Thermal Analysis and Calorimetry, 2022, vol. 147, no. 18, p. 9891-9902. (2021: 4.755 - IF, Q1 - JCR, 0.639 - SJR, Q2 - SJR). ISSN 1388-6150. Dostupné na: <https://doi.org/10.1007/s10973-022-11254-2>.
- 4.ČEPČIANSKA, Jana - PALOU, Martin T. Vývoj krátkodobých mechanicko-fyzikálnych vlastností samozhutniteľných mált pripravených z bieleho cementu s prídavkom polypropylénových vlákien. In SILITECH 2022 - X. celoštátny odborný seminár : zborník príspevkov. - Bratislava : Slovenská technická univerzita v Bratislave, 2022, s. 30-34. ISBN 978-80-227-5219-0.
- 5.ČEPČIANSKA, Jana - PODHORSKÁ, Janette - PALOU, Martin T. Štúdia reologických vlastností samozhutniteľných ťažkých betónov. In Betonárske dni 2022 : zborník príspevkov. - Bratislava : Slovenská technická univerzita v Bratislave, 2022, s. 159-164. ISBN 978-80-227-5235-0.
- 6.PODHORSKÁ, Janette - PALOU, Martin T. - NOVOTNÝ, Radoslav. Vplyv zmrašťovania na vybrané fyzikálne vlastnosti ťažkého betónu = Influence of shrinkage on selected physical properties of heavyweight concrete. In Advances in Architectural, Civil and Environmental Engineering : 31st Annual PhD Student Conference, October 13th 2021, Bratislava [elektronický zdroj].

**9.) Efekt nano-, mikro- a mezo-nehomogenít na makro termomechanické chovanie sa kompozitných konštrukcií** (*Effect of nano-, micro-, and meso-nonhomogeneities in the macroscale thermomechanical performance of composite structure members*)

**Zodpovedný riešiteľ:** Ján Sládek  
**Trvanie projektu:** 1.2.2022 / 31.12.2023  
**Evidenčné číslo projektu:** SK-UA-21-0010  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Ústav stavebníctva a architektúry SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 1 - Ukrajina: 1  
**Čerpané financie:** APVV: 6900 €

Dosiahnuté výsledky:

1. Hrytsyna M., Sladek J., Sladek V. and Hrytsyna O. A Higher-Order Beam Theory for Vibration Analysis of Nanobeams with Including Dynamic Flexoelectric Effect. Abstract Proceedings 5th International Scientific Conference “Structural and Physical Aspects of Construction Engineering, SPACE 2022”, Editors: Kotrasová K., Kormaníková E., Kmet’ S., Sol H., Safaei B., Technical University of Košice, 2022, p. 36.
2. Hrytsyna O., Tokovyy Y., Hrytsyna M. Local gradient theory for dielectrics with non-classical heat conduction law. Proceedings of the 10th International Congress of Croatian Society of Mechanics (September 28 – 30, 2022, Pula, Croatia). Ed. by Ivica Skozrit, Jurica Sorić, Zdenko Tonković. Published by Croatian Society of Mechanics, Zagreb. 2022, p. 137-138.

**10.) Optimálny návrh mikro/nano konštrukcii pre metamateriály (*Optimal design of micro/nano structures for metamaterials*)**

**Zodpovedný riešiteľ:** Ján Sládek  
**Trvanie projektu:** 1.7.2019 / 30.6.2023  
**Evidenčné číslo projektu:** APVV-18-0004  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Ústav stavebníctva a architektúry SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** APVV: 59594 €

Dosiahnuté výsledky:

1. X. Tian, M. Xu, H. Zhou, Q. Li, J. Sladek, V. Sladek: Analytical studies on mode III fracture in flexoelectric solids. Journal of Applied Mechanics 89(4) (2022) 041006.  
<https://doi.org/10.1115/1.4053268>
2. W. Huang, J. Yang, J. Sladek, V. Sladek, P. Wen: Semi-infinite structure analysis with bimodular materials with infinite element, Materials 15 (2022) 641.  
<https://doi.org/10.3390/ma15020641>
3. T. Profant, J. Sladek, V. Sladek, M. Kotoul: Asymptotic solution for interface crack between two materials governed by dipolar gradient elasticity: Amplitude factor evaluation. Theoretical and Applied Fracture Mechanics, 120 (2022) 103378.  
<https://doi.org/10.1016/j.tafmec.2022.103378>
4. L. Sator, V. Sladek, J. Sladek: A strong form meshless method for the solution of FGM plates. Aerospace, 9 (2022) 425. <https://doi.org/10.3390/aerospace908,0425>.
5. O. Hrytsyna, J. Sladek, V. Sladek, M. Hrytsyna: Love waves propagation in layered waveguide structures including flexomagnetism/flexoelectricity and micro-inertia effects. Mechanics of Advanced Materials and Structures (2022) <https://doi.org/10.1080/15376494.2022.2109782>.
6. P.H. Wen, J.C. Wen, J. Sladek, V. Sladek: Stress intensity factors and T-stresses for periodic

array cracks: 3D static and dynamic. *Theoretical and Applied Fracture Mechanics*, 117 (2022) 103198. <https://doi.org/10.1016/j.tafmec.2021.103198>

7.J. Sladek, V. Sladek, M. Hrytsyna, T. Profant: Application of the gradient theory to interface crack between two dissimilar dielectric materials, *Engineering Fracture Mechanics* 276 (2022) 108895. <https://doi.org/10.1016/j.engfracmech.2022.108895>

## Programy: SASPRO

**11.) Zlepšenie štruktúrálnej bezpečnosti a energetickej účinnosti prostredníctvom vývoja trvalo udržateľných cementových kompozitov na báze cementu odolných voči extrémnym teplotám s funkciami samoopravenia po požiari (*Improving Structural Safety and Energy Efficiency Through Development of Extreme Temperature Resistant Sustainable Cement-Based Composites with Post-Fire Self-Healing Features* )**

**Zodpovedný riešiteľ:** Ajitanshu Vedrtam  
**Trvanie projektu:** 1.9.2022 / 31.8.2025  
**Evidenčné číslo projektu:** 1213/02/01  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Ústav stavebníctva a architektúry SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** SAV: 11846 €  
EU: 10960 €

### Dosiahnuté výsledky:

Za posledné štyri mesiace realizácie projektu sme dosiahli pokrok v nasledujúcich cieľoch projektu:

- 1, Vývoj numerického modelu založeného na konečných prvkoch na predpovedanie časových a teplotných zmien, únosnosti, tepelného a zvyškového napätia v CBC.
- 2, Dosiahnutie regenerácie CBC po požiari vývojom tepelne riadených zapuzdrení pre baktérie používané v samoopravnom betóne.
- 3, Stanovenie únosnosti pred požiarom, počas neho a po ňom a zvyškového výkonu CBC počas zahrievaného stavu a žíhaného stavu po požiari a stanovenie vzťahu príčina-účinok pomocou deštruktívneho, ultrazvukového testovania a mikroskopickej charakterizácie.

Ako výstup bude v roku 2023 publikovaná práca

Chaturvedi, S.; Vedrtam, A.; Youssef, M.A.; Palou, M.T.; Barluenga, G.; Kalauni, K. Fire-Resistance Testing Procedures for Construction Elements—A Review. *Fire* **2023**, *6*, 5. <https://doi.org/10.3390/fire6010005>.

**12.) Meranie and modelovanie svetelného znečistenia (*Measuring and Modelling Light Pollution* )**

**Zodpovedný riešiteľ:** Stefan Wallner  
**Trvanie projektu:** 1.9.2022 / 31.8.2025  
**Evidenčné číslo projektu:** 1384/03/01  
**Organizácia je** áno

**koordinátorom projektu:**

**Koordinátor:** Ústav stavebníctva a architektúry SAV, v. v. i.

**Počet spoluriešiteľských** 0

**inštitúcií:**

**Čerpané financie:** SAV: 11784 €

EU: 10960 €

Dosiahnuté výsledky:

V prvých štyroch mesiacoch tohto projektu bola ukončená najmä administratívna príprava na úspešné naplnenie všetkých cieľov projektu. Boli predložené dva články, jeden z nich vo vysoko impaktovanom časopise Nature Astronomy.

V recenznom konaní sú dve publikácie:

Wallner S, Kocifaj M. Aerosol impact on light pollution in cities and their environment. Journal of Environmental Management (požadovaná menšia revízia, zverejnenie sa očakáva začiatkom roka 2023)

Kocifaj M, Kómar L, Lamphar H, Barentine J, Wallner S. A systematic light pollution modeling bias in present night sky brightness predictions. Nature Astronomy (predložená revízia, zverejnenie sa očakáva v roku 2023)

Účasť na workshope o využívaní služieb ECMWF Copernicus Climate Change (C3S) and Atmosphere Monitoring (CAM5) Services v septembri 2022.

V súčasnosti sa pripravujú ďalšie tri publikácie.

**Príloha C**

**Publikačná činnosť organizácie (generovaná z ARL)**

**ADCA Vedecké práce v zahraničných karentovaných časopisoch – impaktovaných**

- ADCA01 ATTIA, Shady\*\* - KURNITSKI, J. - KOSINSKI, Piotr - BORODINECS, Anatolijs - BELAFI, Zsofia Deme - ISTVAN, Kistelegdi - KRSTIC, Hrvoje - MOLDOVAN, Macedon - VISA, Ion - MIHAILOV, Nicolay - EVSTATIEV, Boris - BANIONIS, Karolis - ČEKON, Miroslav - VILČEKOVÁ, Silvia - STRUHALA, Karel - BRZOŇ, Roman - LAURENT, Oriane. Overview and future challenges of nearly zero-energy building (nZEB) design in Eastern Europe. In Energy and Buildings, 2022, vol. 267, art. no. 112165. (2021: 7.201 - IF, Q1 - JCR, 1.682 - SJR, Q1 - SJR). ISSN 0378-7788. Dostupné na: <https://doi.org/10.1016/j.enbuild.2022.112165>
- ADCA02 BARÁ, Salvador\*\* - PEREZ-COUTO, Xabier\*\* - FALCHI, F. - KOCIFAJ, Miroslav - MASANA, Eduard. Estimating linear radiance indicators from the zenith night-sky brightness: on the Posch ratio for natural and light-polluted skies. In Monthly Notices of the Royal Astronomical Society, 2022, vol. 512, no. 2, p. 2125-2134. (2021: 5.235 - IF, Q1 - JCR, 1.678 - SJR, Q1 - SJR, karentované - CCC). (2022 - Current Contents, WOS, SCOPUS, NASA ADS). ISSN 0035-8711. Dostupné na: <https://doi.org/10.1093/mnras/stac410> (APVV-18-0014 : Globálna charakterizácia svetelného znečistenia)
- ADCA03 BOHÁČ, Martin\*\* - KUBÁTOVÁ, Dana - KOTLÁNOVÁ, Michaela Krejčí - KHONGOVÁ, Ingrid - ZEZULOVÁ, Anežka - NOVOTNÝ, Radoslav - PALOU, Martin T. - STANĚK, Theodor - VŠIANSKÝ, Dalibor. The role of Li<sub>2</sub>O, MgO and CuO on SO<sub>3</sub> activated clinkers. In Cement and Concrete Research, 2022, vol. 152, art. no. 106672. (2021: 11.958 - IF, Q1 - JCR, 5.408 - SJR, Q1 - SJR). ISSN 0008-8846. Dostupné na: <https://doi.org/10.1016/j.cemconres.2021.106672>
- ADCA04 ČURPEK, Jakub - ČEKON, Miroslav\*\*. Building performance simulation of a photovoltaic facade enhanced with latent heat storage: Model validation and power generation prediction. In Journal of Energy Storage, 2022, vol. 56, part B, art. no. 106143. (2021: 8.907 - IF, Q1 - JCR, 1.352 - SJR, Q1 - SJR). ISSN 2352-1538. Dostupné na: <https://doi.org/10.1016/j.est.2022.106143>
- ADCA05 GUEYMARD, CH. A. - KOCIFAJ, Miroslav\*\*. Clear-sky spectral radiance modeling under variable aerosol conditions. In Renewable and Sustainable Energy Reviews, 2022, vol. 168, art. no. 112901. (2021: 16.799 - IF, Q1 - JCR, 3.678 - SJR, Q1 - SJR). ISSN 1364-0321. Dostupné na: <https://doi.org/10.1016/j.rser.2022.112901> (APVV-18-0014 : Globálna charakterizácia svetelného znečistenia. VEGA 2/0010/20 : Difúzne svetlo v mestskom prostredí: nový model zohľadňujúci vlastnosti lokálnej atmosféry)
- ADCA06 HRYTSYNA, Olha. The effect of local mass displacement on coupled fields in dielectrics. In Applied Nanoscience, 2022, vol. 12, no. 3, p. 711-723. (2021: 3.869 - IF, Q3 - JCR, 0.505 - SJR, Q2 - SJR). ISSN 2190-5509. Dostupné na: <https://doi.org/10.1007/s13204-021-01714-w> (SK-CN-RD-18-0005 : Multiškálová flexoelektrická teória a nova metóda na detekciu mikrotrhlín v dielektrikách v realnom čase)
- ADCA07 HRYTSYNA, Olha. Electromechanical fields in a hollow piezoelectric cylinder under non-uniform load: flexoelectric effect. In Mathematics and Mechanics of Solids, 2022, vol. 27, no. 2, p. 262-280. (2021: 2.719 - IF, Q2 - JCR, 0.773 - SJR, Q1 - SJR). ISSN 1081-2865. Dostupné na: <https://doi.org/10.1177/10812865211020785> (SK-CN-RD-18-0005 : Multiškálová

- flexoelektrická teória a nová metóda na detekciu mikrotrhlín v dielektrikách v reálnom čase)
- ADCA08 HUANG, Wang - YANG, J. J. - SLÁDEK, Ján - SLÁDEK, Vladimír - WEN, P. H.\*\*. Semi-Infinite Structure Analysis with Bimodular Materials with Infinite Element. In *Materials*, 2022, vol. 15, art. no. 641. (2021: 3.748 - IF, Q1 - JCR, 0.604 - SJR, Q2 - SJR). ISSN 1996-1944. Dostupné na: <https://doi.org/10.3390/ma15020641> (APVV-18-0004 : Optimálny návrh mikro/nano konštrukcií pre metamateriály. VEGA 2/0061/20 : Multiškálové štúdium a modelovanie kompozitných makrokonštrukcií)
- ADCA09 JUNAID, Muhammad Faisal - REHMAN, Zia ur\*\* - IJAZ, Nauman - ČEKON, Miroslav - ČURPEK, Jakub - ELHAG, Ahmed Babeker. Biobased phase change materials from a perspective of recycling, resources conservation and green buildings. In *Energy and Buildings*, 2022, vol. 270, art. no. 112280. (2021: 7.201 - IF, Q1 - JCR, 1.682 - SJR, Q1 - SJR). ISSN 0378-7788. Dostupné na: <https://doi.org/10.1016/j.enbuild.2022.112280>
- ADCA10 KITTLER, Richard\*\* - DARULA, Stanislav. Redistributions of luminance patterns on standard sky types. In *Lighting Research and Technology*, 2022, vol. 54, p. 61-73. (2021: 2.680 - IF, Q2 - JCR, 0.692 - SJR, Q2 - SJR). ISSN 1477-1535. Dostupné na: <https://doi.org/10.1177/14771535211015507> (APVV 0118-12 : Simulovanie denného svetla v umelej oblohe. 2/0017/20 : Výskum priamej zložky dennej osvetlenosti v architektonickom a interiérovom prostredí)
- ADCA11 KOCIFAJ, Miroslav\*\* - BARÁ, Salvador\*\* - FALCHI, F. Towards a global map of the artificial all-sky brightness. In *Monthly Notices of the Royal Astronomical Society: Letters*, 2022, vol. 513, no. 1, p. L25–L29. (2021: 5.235 - IF, Q1 - JCR, 1.705 - SJR, Q1 - SJR). ISSN 1745-3925. Dostupné na: <https://doi.org/10.1093/mnrasl/slac029> (APVV-18-0014 : Globálna charakterizácia svetelného znečistenia. VEGA 2/0010/20 : Difúzne svetlo v mestskom prostredí: nový model zohľadňujúci vlastnosti lokálnej atmosféry)
- ADCA12 KOCIFAJ, Miroslav\*\* - BARÁ, Salvador. Diffuse light around cities: New perspectives in satellite remote sensing of nighttime aerosols. In *Atmospheric Research*, 2022, vol. 266, art. no. 105969. (2021: 5.965 - IF, Q1 - JCR, 1.386 - SJR, Q1 - SJR). ISSN 0169-8095. Dostupné na: <https://doi.org/10.1016/j.atmosres.2021.105969> (APVV-18-0014 : Globálna charakterizácia svetelného znečistenia)
- ADCA13 KOCIFAJ, Miroslav\*\* - KUNDRACIK, F. - BARÁ, Salvador - BARENTINE, John C. - WALLNER, Stefan. Nighttime Atmospheric Scattering Phase Function Derived From the Scattered Light of a Laser Beam. In *Geophysical Research Letters*, 2022, vol. 49, art. no. e2022GL098608. (2021: 5.576 - IF, Q1 - JCR, 1.857 - SJR, Q1 - SJR). ISSN 0094-8276. Dostupné na: <https://doi.org/10.1029/2022GL098608> (APVV-18-0014 : Globálna charakterizácia svetelného znečistenia. VEGA 2/0010/20 : Difúzne svetlo v mestskom prostredí: nový model zohľadňujúci vlastnosti lokálnej atmosféry)
- ADCA14 KÓMAR, Ladislav\*\* - WALLNER, Stefan\*\* - KOCIFAJ, Miroslav. The significant impact of shape deviations of atmospheric aerosols on light monitoring networks. In *Monthly Notices of the Royal Astronomical Society*, 2022, vol. 512, p. 1805-1813. (2021: 5.235 - IF, Q1 - JCR, 1.678 - SJR, Q1 - SJR, karentované - CCC). (2022 - Current Contents, WOS, SCOPUS, NASA ADS). ISSN 0035-8711. Dostupné na: <https://doi.org/10.1093/mnras/stac548> (APVV-18-0014 : Globálna charakterizácia svetelného znečistenia. VEGA 2/0010/20 : Difúzne svetlo v mestskom prostredí: nový model zohľadňujúci vlastnosti lokálnej atmosféry)
- ADCA15 KORÁB, Juraj\*\* - BALOG, Martin - ŽEMLIČKA, Matúš - DRIENOVSKÝ,



- Marián - ŠPANIELKA, Ján - KOVÁČIK, Jaroslav - DVORÁK, Tomáš - ŠTEFÁNIK, Pavol. Thermal behavior of the ZrB<sub>2</sub> skeleton infiltrated with Cu and CuCrZr alloy. In Journal of Composite Materials, 2022, vol. 56, iss. 14, p. 2299-2308. (2021: 3.191 - IF, Q3 - JCR, 0.575 - SJR, Q2 - SJR). ISSN 0021-9983. Dostupné na: <https://doi.org/10.1177/00219983221088394> (ITMS2014+: 313021T081 : Vybudovanie Centra pre využitie pokročilých materiálov Slovenskej akadémie vied)
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- ADMA01 JUNAID, Muhammad Faisal\*\* - REHMAN, Zia ur\*\* - KURUC, Michal - MEDVEĎ, Igor - BACINSKAS, Darius - ČURPEK, Jakub - ČEKON, Miroslav - IJAZ, Nauman - ANSARI, Wajahat Sammer. Lightweight concrete from a perspective of sustainable reuse of waste byproducts. In Construction and Building Materials, 2022, vol. 319, art. no. 126061. (2021: 7.693 - IF, Q1 - JCR, 1.777 - SJR, Q1 - SJR). ISSN 0950-0618. Dostupné na: <https://doi.org/10.1016/j.conbuildmat.2021.126061>

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#### **AFC Publikované príspevky na zahraničných vedeckých konferenciách**

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KUZIELOVÁ, Eva - ŽEMLIČKA, Matúš - MÁSILKO, Jiří - PALOU, Martin T. Pore structure development of blended G-oil well cement submitted to hydrothermal curing conditions. In *Geothermics*, 2017, vol. 68, p. 86–93. (2016: 2.553 - IF, Q2 - JCR, 1.010 - SJR, Q1 - SJR, karentované - CCC). (2017 - Current Contents). ISSN 0375-6505. Dostupné na: <https://doi.org/10.1016/j.geothermics.2017.03.001> (APVV-15-0631 : Výskum vysokohodnotných cementových kompozitov za hydrotermálnych podmienok pre potenciálne využitie v hĺbkových vrtoch. VEGA 1/0696/15 : Vysokoporézne anorganické materiály pre tepelno-izolačné aplikácie)

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KUZIELOVÁ, Eva - ŽEMLIČKA, Matúš - JANČA, Martin - ŠILER, Pavel - PALOU, Martin T. Later stages of Portland cement hydration influenced by

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ADCA116 KUZIELOVÁ, Eva\*\* - ŽEMLIČKA, Matúš - NOVOTNÝ, Radoslav - PALOU, Martin T. Simultaneous effect of silica fume, metakaolin and ground granulated blast-furnace slag on the hydration of multicomponent cementitious binders. In *Journal of Thermal Analysis and Calorimetry*, 2019, vol. 136, iss. 4, p. 1527–1537. (2018: 2.471 - IF, Q2 - JCR, 0.634 - SJR, Q2 - SJR, karentované - CCC). (2019 - Current Contents). ISSN 1388-6150. Dostupné na: <https://doi.org/10.1007/s10973-018-7813-7> (APVV-15-0631 : Výskum vysokohodnotných cementových kompozitov za hydrotermálnych podmienok pre potenciálne využitie v hĺbkových vrtoch. VEGA 2/0097/17 : Štúdium procesov hydratácie a vývoja mikroštruktúry v mnohozložkových cementových spojivách)

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ADCA117 KUZIELOVÁ, Eva\*\* - ŽEMLIČKA, Matúš - NOVOTNÝ, Radoslav - PALOU, Martin T. Middle stage of Portland cement hydration influenced by different portions of silica fume, metakaolin and ground granulated blast-furnace slag. In *Journal of Thermal Analysis and Calorimetry*, 2019, vol. 138, iss. 6, p. 4119–4126. (2018: 2.471 - IF, Q2 - JCR, 0.634 - SJR, Q2 - SJR, karentované - CCC). (2019 - Current Contents). ISSN 1388-6150. Dostupné na: <https://doi.org/10.1007/s10973-019-08313-6> (APVV-15-0631 : Výskum vysokohodnotných cementových

kompozitov za hydrotermálnych podmienok pre potenciálne využitie v hĺbkových vrtoch. VEGA 2/0097/17 : Štúdium procesov hydratácie a vývoja mikroštruktúry v mnohozložkových cementových spojivách)

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ADCA154

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ADCA155

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ADCB04

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ADMA06

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#### ADMB Vedecké práce v zahraničných neimpaktovaných časopisoch registrovaných v databázach Web of Science alebo SCOPUS

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AEC02 KITTLER, Richard. Standardisation of the outdoor conditions for the calculation of the Daylight Factor with clear. In Sunlight in Buildings : proceedings CIE international conference. - Rotterdam : Boucentrum, 1967, p. 273-286.

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*1. [1.1] SUN, C. - QI, X. N. - HAN, Y. S. Seasonal characteristics of CIE standard sky types in northeast China. In SOLAR ENERGY. ISSN 0038-092X, 2021, vol. 220, p. 152-162., Registrované v: WOS*

AEC03 MORAVČÍKOVÁ, Henrieta. Stavět v Tatrách: dilemma formy. Architektura Vysokých Tater šedesátých a sedmdesátých let 20. století [Building in Tatras: the Dilemma of the Form. Architecture in High Tatras in 1960s and 1970s]. In Tvary, formy, ideje : studie a eseje k dějinám a teorii architektury. Zostavovateľ T. Petrasová a M. Platovská. - Praha : Ústav dějin umění Akademie věd České republiky, 2013, s. 131-143. ISBN 978-80-86890-47-0.

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*1. [2.1] KOS, Lukas. HOTEL PANORAMA IN THE HIGH TATRA MOUNTAINS, NORTH VIEW, DURING 1970S. In ARCHITEKTURA & URBANIZMUS, 2021, vol. 55, no. 1-2, pp. 46-59. ISSN 0044-8680. Dostupné na: <https://doi.org/10.31577/archandurb.2021.55.1-2.4>., Registrované v: WOS*

AEC04 PALOU, Martin T. - MAJLING, J. - JANOTKA, Ivan. The performance of blended cements based on sulphoaluminate-belite and Portland cements. In Proceedings of the 11-th International Congress on Chemistry of Cement : Durban, South Africa, 11-16 May 2003. - Durban : G. Grieve and G. Oweis, 2003, p. 1896-1902. ISBN 0-9584085-8-0.

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AEC05 ZHANG, Chuanzeng - SLÁDEK, Ján - SLÁDEK, Vladimír. Transient dynamic analysis of cracked functionally graded materials. In Advances in Fracture and Damage Mechanics IV. Editors M. H. Aliabadi, F. G. Buchholtz, J. Alfaiate, J. Planas, B. Abersek, S. Neshida. - London : EC Press Ltd., 2005, p. 301-308.

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#### \*AEF Vedecké práce v domácich nerecenzovaných vedeckých zborníkoch, monografiách

AEF01 KORONTHÁLYOVÁ, Oľga - MATIAŠOVSKÝ, Peter. Pore Structure and Thermal Conductivity of Burnt Clay Bricks. In Thermophysics 2007 : proceedings. Editor J. Leja. - Bratislava : Vydavateľstvo STU, 2007, p. 100-106. ISBN 978-80-227-27465-4.

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1. [1.1] LIMAMI, Houssame - MANSSOURI, Imad - CHERKAOUI, Khalid - KHALDOUN, Asmae. *Physicochemical, mechanical and thermal performance of lightweight bricks with recycled date pits waste additives. In JOURNAL OF BUILDING ENGINEERING, 2021, vol. 34, art. no. 101867. Dostupné na: <https://doi.org/10.1016/j.jobe.2020.101867>., Registrované v: WOS*
2. [1.1] MOHAN, Harish T. - WHITAKER, Francesca - DANIELGASKELL - MOHAN, Renjith - MINI, K. M. *Performance assessment of recycled LDPE with sand fillers. In MATERIALS TODAY-PROCEEDINGS, 2021, vol. 42, pp. 1526-1530. ISSN 2214-7853. Dostupné na: <https://doi.org/10.1016/j.matpr.2021.02.285>., Registrované v: WOS*

**AFC Publikované príspevky na zahraničných vedeckých konferenciách**

AFC01 DARULA, Stanislav - KITTLER, Richard. CIE General Sky standard defining luminance distributions. In Proceeding Conference eSim 2002. The Canadian conference on building energy simulation : september 11th - 13th, 2002, Montreal. Dostupné na internete: <[http://www.ustarch.sav.sk/wp-content/uploads/darula\\_kittler\\_proc\\_conf\\_esim\\_2002.pdf](http://www.ustarch.sav.sk/wp-content/uploads/darula_kittler_proc_conf_esim_2002.pdf)>

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2. [1.1] CAMPANA, Pietro Elia - STRIDH, Bengt - AMADUCCI, Stefano - COLAUZZI, Michele. *Optimisation of vertically mounted agrivoltaic systems. In JOURNAL OF CLEANER PRODUCTION, 2021, vol. 325, art. no. 129091. ISSN 0959-6526. Dostupné na: <https://doi.org/10.1016/j.jclepro.2021.129091>., Registrované v: WOS*
3. [1.1] CONRAD, Bradley M. - JOHNSON, Matthew R. *An uncertainty-based protocol for the setup and measurement of soot-black carbon emissions from gas flares using sky-LOSA. In ATMOSPHERIC MEASUREMENT TECHNIQUES, 2021, vol. 14, no. 2, pp. 1573-1591. ISSN 1867-1381. Dostupné na: <https://doi.org/10.5194/amt-14-1573-2021>., Registrované v: WOS*
4. [1.1] COSTA, Jonathas - BOCK, Alexander - EMMART, Carter - HANSEN, Charles - YNNERMAN, Anders - SILVA, Claudio. *Interactive Visualization of Atmospheric Effects for Celestial Bodies. In IEEE TRANSACTIONS ON VISUALIZATION AND COMPUTER GRAPHICS, 2021, vol. 27, no. 2, pp. 785-795. ISSN 1077-2626. Dostupné na: <https://doi.org/10.1109/TVCG.2020.3030333>., Registrované v: WOS*
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6. [1.1] GRANADOS-LOPEZ, Diego - SUAREZ-GARCIA, Andres - DIEZ-MEDIAVILLA, Montserrat - ALONSO-TRISTAN, Cristina. *Feature selection for CIE standard sky classification. In SOLAR ENERGY, 2021, vol. 218, pp. 95-107.*



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7. [1.1] KHAN, Nabeel Ahmed - BHATTACHARJEE, Bishwajit. Methodology for Simultaneous Optimization of the Thermal, Visual, and Acoustic Performance of Building Envelope. In JOURNAL OF ARCHITECTURAL ENGINEERING, 2021, vol. 27, no. 3, art. no. 04021015. ISSN 1076-0431. Dostupné na:

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8. [1.1] KUSZNIER, Jacek - WOJTKOWSKI, Wojciech. IoT Solutions for Maintenance and Evaluation of Photovoltaic Systems. In ENERGIES, 2021, vol. 14, no. 24, art. no. 8567. Dostupné na: <https://doi.org/10.3390/en14248567.>,  
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9. [1.1] NARDIN, G. - DOMINGUEZ, C. - AGUILAR, A. F. - ANGLADE, L. - DUCHEMIN, M. - SCHUPPISSER, D. - GERLICH, F. - ACKERMANN, M. - COULOT, L. - CUENOD, B. - PETRI, D. - NIQUILLE, X. - BADEL, N. - LACHOWICZ, A. - DESPEISSE, M. - LEVRAT, J. - BALLIF, C. - ASKINS, S. - NUNEZ, R. - JOST, N. - VALLEROTTO, G. - ANTON, I. Industrialization of hybrid Si/III-V and translucent planar micro-tracking modules. In PROGRESS IN PHOTOVOLTAICS. ISSN 1062-7995, 2021, vol. 29, no. 7, p. 819-834.,  
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10. [1.1] PHUONG THI KHANH NGUYEN - HA THI HAI PHAM - SOLOVYEV, Aleksei Kirillovich - TAMRAZYAN, Ashot Georgievich. Improving the Accuracy of Daylight Calculation with Impact of Sun-Shading Devices for the Russian Standard. In ENGINEERING JOURNAL-THAILAND, 2021, vol. 25, no. 7, pp. 109-120. ISSN 0125-8281. Dostupné na:

<https://doi.org/10.4186/ej.2021.25.7.109.>, Registrované v: WOS

11. [1.1] SEPULVEDA, Abel - BUENO, Bruno - WANG, Taoning - WILSON, Helen Rose. Benchmark of methods for annual glare risk assessment. In BUILDING AND ENVIRONMENT, 2021, vol. 201, art. no. 108006. ISSN 0360-1323. Dostupné na: <https://doi.org/10.1016/j.buildenv.2021.108006.>,  
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14. [1.1] YUN, Su-In - JEONG, Jae-Weon - CHOI, Anseop. Photopic illuminance-based black-box model for regulation of human circadian rhythm via daylight control. In BUILDING AND ENVIRONMENT, 2021, vol. 203, art. no. 108069. ISSN 0360-1323. Dostupné na: <https://doi.org/10.1016/j.buildenv.2021.108069.>,  
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1. [1.1] ALSHAIBANI, Khalid - LI, Danny. Sky type classification for the ISO/CIE Standard General Skies: a proposal for a new approach. In *INTERNATIONAL JOURNAL OF LOW-CARBON TECHNOLOGIES*, 2021, vol. 16, no. 3, pp. 921-926. ISSN 1748-1317. Dostupné na: <https://doi.org/10.1093/ijlct/ctab020>., Registrované v: WOS
2. [1.1] CHEN, Wenqiang - LI, Danny H. W. - LI, Shuyang - LOU, Siwei. Predicting diffuse solar irradiance on obstructed building facades under irregular skyline patterns for various ISO/CIE standard skies. In *JOURNAL OF BUILDING ENGINEERING*, 2021, vol. 40, no., pp. Dostupné na: <https://doi.org/10.1016/j.jobee.2021.102370>., Registrované v: WOS
3. [1.1] CHEN, Wenqiang - LI, Danny H. W. - LI, Shuyang. Evaluation of Energy Savings of Daylight-Linked Lighting Control Strategies Using Different Sky Distribution Models. In *PROCEEDINGS OF BUILDING SIMULATION 2019: 16TH CONFERENCE OF IBPSA*, 2020, pp. 1068-1074. ISSN 2522-2708. Dostupné na: <https://doi.org/10.26868/25222708.2019.210626>., Registrované v: WOS
4. [1.1] SUN, Cheng - QI, Xuanning - HAN, Yunsong. Seasonal characteristics of CIE standard sky types in northeast China. In *SOLAR ENERGY*, 2021, vol. 220, no., pp. 152-162. ISSN 0038-092X. Dostupné na: <https://doi.org/10.1016/j.solener.2021.03.015>., Registrované v: WOS
5. [1.1] TORRES, Jose Luis - GARCIA, Ignacio. Analytical expressions for estimating sky diffuse irradiance and illuminance on tilted planes for the CIE Standard General Skies. In *RENEWABLE ENERGY*, 2021, vol. 174, no., pp. 320-335. ISSN 0960-1481. Dostupné na: <https://doi.org/10.1016/j.renene.2021.04.059>., Registrované v: WOS

## AGI Správy o vyriešených vedeckovýskumných úlohách

- AGI01 KINZEY, Bruce - PERRIN, Tess E. - MILLER, Naomi J. - KOCIFAJ, Miroslav - AUBÉ, Martin - SOLANO LAMPHAR, H. A. An Investigation of LED Street Lighting's Impact on Sky Glow. Richland, Washington : Pacific Northwest National Laboratory, 2017. 38 p. Dostupné na internete: [https://energy.gov/sites/prod/files/2017/05/f34/2017\\_led-impact-sky-glow.pdf](https://energy.gov/sites/prod/files/2017/05/f34/2017_led-impact-sky-glow.pdf)

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2. [1.1] BOUROUSSIS, Constantinos A. - TOPALIS, Frangiskos. Assessment of outdoor lighting installations and their impact on light pollution using unmanned aircraft systems The concept of the drone-gonio-photometer. In *JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER*. ISSN 0022-4073, 2020, vol. 253, art. no. 107155. Dostupné na: <https://doi.org/10.1016/j.jqsrt.2020.107155>., Registrované v: WOS
3. [1.1] HUNG, Li-Wei - ANDERSON, Sharolyn J. - PIPKIN, Ashley - FRISTRUP, Kurt. Changes in night sky brightness after a countywide LED retrofit. In *JOURNAL OF ENVIRONMENTAL MANAGEMENT*. ISSN 0301-4797, 2021, vol. 292, art. no. 112776. Dostupné na: <https://doi.org/10.1016/j.jenvman.2021.112776>., Registrované v: WOS
4. [1.1] PAUWELS, Julie - LE VIOL, Isabelle - BAS, Yves - VALET, Nicolas -

*KERBIRIOU, Christian. Adapting street lighting to limit light pollution's impacts on bats. In GLOBAL ECOLOGY AND CONSERVATION. ISSN 2351-9894, 2021, vol. 28, art. no. e01648. Dostupné na:*

*<https://doi.org/10.1016/j.gecco.2021.e01648>., Registrované v: WOS*

*5. [1.1] TAVARES, Pedro - INGI, Dmitrii - ARAUJO, Luiz - PINHO, Paulo - BHUSAL, Pramod. Reviewing the Role of Outdoor Lighting in Achieving Sustainable Development Goals. In SUSTAINABILITY, 2021, vol. 13, no. 22, art. no. 12657. Dostupné na: <https://doi.org/10.3390/su132212657>., Registrované v: WOS*

AGI02 KITTLER, Richard - DARULA, Stanislav - PEREZ, Richard. A set of standard skies characterising daylight conditions for computer and energy conscious design. U.S. – Slovak Science and technology Cooperation 1991-1998 : Final Report. American-Slovak Grant Project US-SK 92052. Bratislava : ICA SAS, 1998. 240 p.

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*1. [1.1] OBRADOVIC, Biljana - MATUSIAK, Barbara. A customised method for estimating light transmission efficiency of the horizontal light pipe via a temporal parameter with an example application using laser-cut panels as a collector. In METHODSX, 2021, vol. 8, art. no. 101339. Dostupné na:*

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*<https://doi.org/10.1016/j.solener.2021.03.015>., Registrované v: WOS*

*3. [1.1] TORRES, Jose Luis - GARCIA, Ignacio. Analytical expressions for estimating sky diffuse irradiance and illuminance on tilted planes for the CIE Standard General Skies. In RENEWABLE ENERGY, 2021, vol. 174, pp. 320-335. ISSN 0960-1481. Dostupné na: <https://doi.org/10.1016/j.renene.2021.04.059>.,*

*Registrované v: WOS*

AGI03 KNOOP, Martine - AKTUNA, Berat - BUENO, Bruno - DARULA, Stanislav - DENEYER, Arnaud, 070 - DIAKITE, Aicha, 070 - FUHRMANN, Peter - GEISLER-MORODER, David - HUBSCHNEIDER, Carolin - JOHNSEN, Kjeld - KOSTRO, Andre - MALÍKOVÁ, Marta - MATUSIAK, Barbara - PRELLA, Patrick - POHL, Wilfried - TAO, Luo - TETRI, Eino. Daylighting and Electric Lighting Retrofit solutions. Editor M. Knoop. Berlin : Universitätsverlag der TU Berlin, 2016. 87 p. Dostupné na internete: <<http://dx.doi.org/10.14279/depositonce-5162>>. ISBN 978-3-7983-2836-5

Citácie:

*1. [1.1] ARNAOUTAKIS, Georgios E. - KATSAPRAKAKIS, Dimitris A. Energy Performance of Buildings with Thermochromic Windows in Mediterranean Climates. In ENERGIES, 2021, vol. 14, no. 21, art. no. 6977. Dostupné na:*

*<https://doi.org/10.3390/en14216977>., Registrované v: WOS*

## **BAB Odborné knižné publikácie vydané v domácich vydavateľstvách**

BAB01 KITTLER, Richard - DARULA, Stanislav - PEREZ, Richard. A set of standard skies characterising daylight conditions for computer and energy conscious design. Bratislava : Polygrafia SAV, 1998. 52 p.

Citácie:

*1. [1.1] AGHIMIEN, Emmanuel I. - LI, Danny H. W. - CHEN, Wenqiang - TSANG, Ernest K. W. Daylight luminous efficacy: An overview. In SOLAR ENERGY, 2021, vol. 228, no., pp. 706-724. ISSN 0038-092X. Dostupné na:*

- <https://doi.org/10.1016/j.solener.2021.05.018>., Registrované v: WOS
2. [1.1] ALSHAIBANI, K. - LI, D. Sky type classification for the ISO/CIE Standard General Skies: a proposal for a new approach. In *INTERNATIONAL JOURNAL OF LOW-CARBON TECHNOLOGIES*. ISSN 1748-1317, 2021, vol. 16, no. 3, p. 921-926. Dostupné na: <https://doi.org/10.1093/ijlct/ctab020>., Registrované v: WOS
3. [1.1] CHEN, Wenqiang - LI, Danny H. W. - LI, Shuyang - LOU, Siwei. Predicting diffuse solar irradiance on obstructed building facades under irregular skyline patterns for various ISO/CIE standard skies. In *JOURNAL OF BUILDING ENGINEERING*, 2021, vol. 40, no., pp. Dostupné na: <https://doi.org/10.1016/j.jobe.2021.102370>., Registrované v: WOS
4. [1.1] GRANADOS-LOPEZ, D. - GARCIA-RODRIGUEZ, A. - GARCIA-RODRIGUEZ, S. - SUAREZ-GARCIA, A. - DIEZ-MEDIAVILLA, M. - ALONSO-TRISTAN, C. Pixel-Based Image Processing for CIE Standard Sky Classification through ANN. In *COMPLEXITY*, 2021, vol. 2021, art. no. 2636157. ISSN 1076-2787. Dostupné na: <https://doi.org/10.1155/2021/2636157>., Registrované v: WOS

**FAI Zostavovateľské práce knižného charakteru (bibliografie, encyklopédie, katalógy, slovníky, zborníky, atlasy ...)**

- FAI01 Konček Skoček Titl : katalóg výstavy. Editori Katarína Andrášiová, Nina Bartošová. Bratislava : STU, 2013. 58 s. ISBN 978-80-227-3922-1  
Citácie:  
1. [2.1] MORAVCIKOVA, H. - SZALAY, P. The Trade Union House/Istropolis: The Birth and Liquidation of an Innovative Generator of Social Life, Culture, and Education. In *ARCHITEKTURA & URBANIZMUS*. ISSN 0044-8680, 2021, vol. 55, no. 3-4, pp. 122-145. Dostupné na: <https://doi.org/10.31577/archurb.2021.55.3-4.1>., Registrované v: WOS
- FAI02 Singular Integrals in Boundary Element Methods. Edited by V. Sládek, J. Sládek. Southampton & Boston : WIT Press Publishing, 1998. 448 p. ISBN 978-1-85312-533-1  
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1. [1.1] MARSHALL, Joshua P. - RICHARDSON, J. D. A three-dimensional, p-version BEM: High-order refinement leveraged through regularization. In *ENGINEERING ANALYSIS WITH BOUNDARY ELEMENTS*, 2021, vol. 122, pp. 13-20. ISSN 0955-7997. Dostupné na: <https://doi.org/10.1016/j.enganabound.2020.09.015>., Registrované v: WOS  
2. [1.1] REJWER-KOSINSKA, Ewa - RYBARSKA-RUSINEK, Liliana - LINKOV, Aleksandr. On evaluation of local fields by fast multipole method employing smooth equivalent/check surfaces. In *APPLIED MATHEMATICS AND COMPUTATION*, 2021, vol. 408, art. no. 126363. ISSN 0096-3003. Dostupné na: <https://doi.org/10.1016/j.amc.2021.126363>., Registrované v: WOS

## **Príloha D**

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

#### Semestrálne prednášky:

doc. Ing. Miroslav Čekon, PhD.

Názov semestr. predmetu: Progresívne materiály a technológie budov

Počet hodín za semester: 18

Názov katedry a vysokej školy: Slovenská technická univerzita v Bratislave, Katedra materialového inžinierstva a fyziky

doc. Ing. Miroslav Čekon, PhD.

Názov semestr. predmetu: Stavebná tepelná technika

Počet hodín za semester: 8

Názov katedry a vysokej školy: Slovenská technická univerzita v Bratislave, Katedra materialového inžinierstva a fyziky

Ing. Jakub Čurpek, PhD.

Názov semestr. predmetu: Progresívne materiály a technológie budov

Počet hodín za semester: 6

Názov katedry a vysokej školy: Stavebná fakulta STU, Katedra materiálového inžinierstva a fyziky

Ing. Jakub Čurpek, PhD.

Názov semestr. predmetu: Stavebná tepelná technika

Počet hodín za semester: 8

Názov katedry a vysokej školy: Stavebná fakulta STU, Katedra materiálového inžinierstva a fyziky

doc. Ing. Stanislav Darula, CSc.

Názov semestr. predmetu: Building Physics - Daylighting

Počet hodín za semester: 8

Názov katedry a vysokej školy: Slovenská technická univerzita v Bratislave, Katedra konštrukcií pozemných stavieb

Ing. Peter Matiašovský, CSc.

Názov semestr. predmetu: Metodológia vedeckého experimentu

Počet hodín za semester: 4

Názov katedry a vysokej školy: Stavebná fakulta STU, Katedra konštrukcií pozemných stavieb

Prof.Dr.Ing. Martin-Tchingnabé Palou

Názov semestr. predmetu: Building Materials

Počet hodín za semester: 24

Názov katedry a vysokej školy: Stavebná fakulta STU, Katedra materiálového inžinierstva a fyziky

Prof.Dr.Ing. Martin-Tchingnabé Palou

Názov semestr. predmetu: Chémia stavebných materiálov

Počet hodín za semester: 24

Názov katedry a vysokej školy: Stavebná fakulta STU, Katedra materiálového inžinierstva a fyziky

Prof.Dr.Ing. Martin-Tchingnabé Palou

Názov semestr. predmetu: Maltoviny

Počet hodín za semester: 24

Názov katedry a vysokej školy: Stavebná fakulta STU, Katedra materiálového inžinierstva a fyziky

Prof.Dr.Ing. Martin-Tchingnabé Palou

Názov semestr. predmetu: Priemyselná anorganická chémia

Počet hodín za semester: 24

Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, Ústav anorganickej chémie, technológie a materiálov

Prof.Dr.Ing. Martin-Tchingnabé Palou

Názov semestr. predmetu: Špeciálna technológia anaorganických materiálov

Počet hodín za semester: 24

Názov katedry a vysokej školy: Fakulta chemickej a potravinárskej technológie STU, Ústav anorganickej chémie, technológie a materiálov

Ing. Richard Slávik, PhD.

Názov semestr. predmetu: Building Physics

Počet hodín za semester: 26

Názov katedry a vysokej školy: Mendelova univerzita, Brno, Česká republika, Ústav nauky o drevě a dřevařských technologií

Ing. Richard Slávik, PhD.

Názov semestr. predmetu: Energetické vlastnosti budov

Počet hodín za semester: 26

Názov katedry a vysokej školy: Mendelova univerzita, Brno, Česká republika, Ústav nauky o drevě a dřevařských technologií

Ing. Richard Slávik, PhD.

Názov semestr. predmetu: Navrhování dřevěných prvků a konstrukcí

Počet hodín za semester: 26

Názov katedry a vysokej školy: Mendelova univerzita, Brno, Česká republika, Ústav nauky o drevě a dřevařských technologií

Dr. Stefan Wallner, BSc MSc

Názov semestr. predmetu: Science communication in Astronomy

Počet hodín za semester: 28

Názov katedry a vysokej školy: University of Vienna, Austria, Department of Astrophysics

Semestrálne cvičenia:

doc. Ing. Miroslav Čekon, PhD.

Názov semestr. predmetu: Progresívne materiály a technológie budov

Počet hodín za semester: 12

Názov katedry a vysokej školy: Slovenská technická univerzita v Bratislave, Katedra materialového inžinierstva a fyziky

doc. Ing. Miroslav Čekon, PhD.

Názov semestr. predmetu: Stavebná tepelná technika

Počet hodín za semester: 20

Názov katedry a vysokej školy: Slovenská technická univerzita v Bratislave, Katedra materialového inžinierstva a fyziky

Ing. Jakub Čurpek, PhD.

Názov semestr. predmetu: Ateliérová tvorba

Počet hodín za semester: 26

Názov katedry a vysokej školy: Stavebná fakulta STU, Katedra materiálového inžinierstva a fyziky

Ing. Jakub Čurpek, PhD.

Názov semestr. predmetu: Progresívne materiály a technológie budov

Počet hodín za semester: 13

Názov katedry a vysokej školy: Stavebná fakulta STU, Katedra materiálového inžinierstva a fyziky

Ing. Jakub Čurpek, PhD.

Názov semestr. predmetu: Stavebná tepelná technika

Počet hodín za semester: 26

Názov katedry a vysokej školy: Stavebná fakulta STU, Katedra materiálového inžinierstva a fyziky

Ing. Richard Slávik, PhD.

Názov semestr. predmetu: Energetické vlastnosti budov

Počet hodín za semester: 26

Názov katedry a vysokej školy: Mendelova univerzita, Brno, Česká republika, Ústav nauky o dřevě a dřevařských technologiích

Ing. Richard Slávik, PhD.

Názov semestr. predmetu: Navrhování dřevěných prvků a konstrukcí

Počet hodín za semester: 26

Názov katedry a vysokej školy: Mendelova univerzita, Brno, Česká republika, Ústav nauky o dřevě a dřevařských technologiích

#### Semináre:

#### Terénne cvičenia:

#### Individuálne prednášky:

doc. Ing. Stanislav Darula, CSc.

Názov semestr. predmetu: Osvětlovací technika

Počet hodín za semester: 2

Názov katedry a vysokej školy: Vysoké učení technické, Brno, FEKT

Ing. Eva Kuzielová, PhD.

Názov semestr. predmetu: Laboratórium chemických technológií I

Počet hodín za semester: 4

Názov katedry a vysokej školy: Slovenská technická univerzita v Bratislave, Oddelenie anorganických materiálov



**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
<b>Počet vyslaní spolu</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
<b>Počet prijatí spolu</b>						

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

Krajina	Názov konferencie	Meno pracovníka	Počet dní
Chorvátsko	ICCSM	Hrytsyna Olha	5
Portugalsko	ICMS	Hrytsyna Olha	4
Portugalsko	ECF23	Sládek Ján	5
Španielsko	FDM	Sládek Ján	5
Chorvátsko	ICSID	Sládek Ján	6
<b>Spolu</b>			<b>25</b>

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

Skratky použité v tabuľke C:

ICCSM 2022 - The 10th International Congress of Croatian Society of Mechanics

ICMS 2022 - The 1st International Conference on Mechanics of Solids

ECF23 - European Conference on Fracture 2022

FDM - International conference on fracture and damage mechanics

ICSID - 6th International Conference on Structural Integrity and Durability

**Príloha F**

**Vedecko-popularizačná činnosť pracovníkov organizácie SAV**

Meno	Spoluautori	Typ <sup>1</sup>	Názov	Miesto zverejnenia	Dátum alebo počet za rok
Kocifaj M.		TL	O novej optickej metóde merania atmosférického aerosólu	<a href="https://www.sav.sk/?lang=sk&amp;doc=services-news&amp;source_no=20&amp;news_no=10441">https://www.sav.sk/?lang=sk&amp;doc=services-news&amp;source_no=20&amp;news_no=10441</a>	20.6.2022
Kocifaj M.		IN	SAS scientists developed a new optical method for measuring atmospheric aerosols	<a href="https://spectator.sme.sk/c/23045494/how-much-time-do-people-dedicate-to-beauty-slovak-scientist-contribute-to-research.html">https://spectator.sme.sk/c/23045494/how-much-time-do-people-dedicate-to-beauty-slovak-scientist-contribute-to-research.html</a>	31.10.2022
Kocifaj M.		IN	Svetelné znečistenie	<a href="https://www.postoj.sk/114603/biele-svetlo-v-uliciach-je-hrozbou-pre-obyvateľov-i-cely-ekosystem">https://www.postoj.sk/114603/biele-svetlo-v-uliciach-je-hrozbou-pre-obyvateľov-i-cely-ekosystem</a>	19.9.2022
Darula S.		PB	Denné osvetlenie	ÚSTARCH SAV	19.10.2022
Darula S.		EX	exkurzia na pracovisku	ÚSTARCH SAV	15.11.2022
Sládek J.		PB	Summer School	Dubrovnik, Chorvátsko	20.9.2022
Solano Lamphar. H. A.		IN	Cielos oscuros. Su importancia y la necesidad de protegerlos	<a href="https://revista.unaminternacional.unam.mx/nota/3/cielos-oscuros-su-importancia-y-la-necesidad-de-protegerlos">https://revista.unaminternacional.unam.mx/nota/3/cielos-oscuros-su-importancia-y-la-necesidad-de-protegerlos</a>	31.10.2022
Wallner S.		PB	Licht und Satelliten als neue Sterne: Die Verschmutzung des Nachthimmels	Planetárium Viedeň	27.5.2022
Wallner S.		PB	Lichtsmog	Observatórium Leiserberge, Niederleis	28.7.2022
Wallner S.		PB	Science Village Talks: Der Himmel	Bauernmuehle Mattersburg	7.6.2022

			über dem Burgenland		
Wallner S.		RO	ö1 Dimensionen: Dunkle Seiten	Radio Ö1	15.11.2022
Podhorská J.		IN	Zostrih z podujatia Deň otvrených dverí	<a href="https://www.youtube.com/watch?v=rH6g5W2DWRw">https://www.youtube.com/watch?v=rH6g5W2DWRw</a>	7.7.2022

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