

**МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ**  
**Прикарпатський національний університет імені Василя Стефаника**  
Фізико-хімічний інститут  
ННЦ «Напівпровідникове матеріалознавство»  
**АКАДЕМІЯ НАУК ВИЩОЇ ШКОЛИ УКРАЇНИ**  
**НАЦІОНАЛЬНА АКАДЕМІЯ НАУК УКРАЇНИ**  
Інститут фізики напівпровідників ім. В.Є. Лашкарьова  
Інститут металофізики ім. Г.В. Курдюмова  
**Українське фізичне товариство**  
**Благодійний фонд "Івано-Франківське математичне товариство"**

**XIX МІЖНАРОДНА ФРЕЙКІВСЬКА КОНФЕРЕНЦІЯ З ФІЗИКИ І  
ТЕХНОЛОГІЇ ТОНКИХ ПЛІВОК ТА НАНОСИСТЕМ**

**Програма**

Івано-Франківськ, 09-14 жовтня 2023 р.

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Ivano-Frankivsk, October, 09-14, 2023

**Program**

**XIX INTERNATIONAL FREIK CONFERENCE ON PHYSICS AND  
TECHNOLOGY OF THIN FILMS AND NANOSYSTEMS**

**MINISTRY OF EDUCATION AND SCIENCE, YOUTH AND SPORT  
OF UKRAINE**

**Vasyl Stefanyk Precarpathian National University**  
Physical-Chemical Institute

Science & Educational Centre of semiconductor material science  
**ACADEMY OF SCIENCE OF HIGH SCHOOL OF UKRAINE**

**NATIONAL ACADEMY OF SCIENCE OF UKRAINE**

V.E. Lashkarev Institute of Semiconductor Physics  
G.V. Kurdyumov Institute of the Physics of Metals

**Ukraine Physics Society**

**CO "Charitable Foundation "Ivano-Frankivsk Mathematical Society"**

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## ТЕМАТИКА СЕКЦІЙ

1. Технологія тонких плівок (метали, напівпровідники, діелектрики, провідні полімери) і методи їх дослідження.
2. Нанотехнології, наноматеріали і квантово-розмірні структури.
3. Фізико-хімічні властивості тонких плівок.
4. Тонкоплівкові елементи електронних пристроїв, наноелектроніка.
5. Функціональні кристалічні матеріали: ріст, фізичні властивості, використання.
6. Тонкоплівкові технології для енергозаощадження.
7. Наноматеріали для біомедичного призначення.
8. Інноваційні методики викладання природничих дисциплін

## TOPICS

1. Thin films technology (metals, semiconductors, dielectrics, conductive polymers) and their research methods.
2. Nanotechnologies and nanomaterials, quantum-size structures.
3. Physical-chemical properties of thin films.
4. Thin film compounds for electronic devices, nanoelectronics.
5. Functional crystalline materials: growth, physical properties and applications.
6. Thin films technology for energy saving.
7. Nanomaterials for biomedical application.
8. Innovative methods for teaching.

## МОВИ КОНФЕРЕНЦІЇ / LANGUAGES:

Англійська  
Українська

English  
Ukrainian

## ПУБЛІКАЦІЯ МАТЕРІАЛІВ КОНФЕРЕНЦІЇ / CONFERENCE PUBLISHING

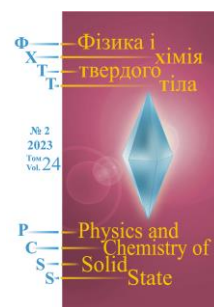
Планується публікація тез доповідей та матеріалів конференції.

Головуючі секціями будуть рекомендувати кращі доповіді до друку у журналі “[Materials Today: Proceeding](#)” (SNIP 0.657).

Партнером конференції є науковий журнал “[Physics and Chemistry of the Solid State](#)” (ISSN 1729-4428, e-ISSN 2309-8589; *Scopus, WoS*)

In addition to the abstract book, the best papers will be recommend to publish in the scientific journals “[Materials Today: Proceeding](#)” (SNIP 0.657).

Scientific Journal “[Physics and Chemistry of the Solid State](#)” (ISSN 1729-4428, e-ISSN 2309-8589; *Scopus, WoS*) is the premium partner of ICPTTFN-XIX





## SCHEDULE of ICPTTFN-XIX

Date Time	October 9, Monday	October 10, Tuesday		October 11, Wednesday		October 12, Thursday	October 13, Friday	
9 <sup>00</sup> -13 <sup>30</sup>	Arrival of participants  Registration	10 <sup>00</sup> -10 <sup>30</sup>	<b>Opening ceremony</b>	9 <sup>00</sup> -9 <sup>45</sup>	<b>Invited speaker Prof. Egon PAVLICA</b>	Excursion  ( <a href="#">Goshiv</a>  –  <a href="#">Bubnyshche</a> )	9 <sup>00</sup> -9 <sup>45</sup>	<b>Invited speaker Prof. Maksym STRIKHA</b>
		10 <sup>30</sup> -11 <sup>15</sup>	<b>Invited speaker Prof. Zinovi DASHEVSKY</b>	9 <sup>45</sup> -11 <sup>00</sup>	<i>Conference session (2)</i>		9 <sup>45</sup> -10 <sup>30</sup>	<b>Invited speaker Prof. Yuriy KHALAVKA</b>
		11 <sup>15</sup> -12 <sup>00</sup>	<b>Invited speaker Prof. Sandra GARDONIO</b>	11 <sup>00</sup> -11 <sup>30</sup>	Coffee break		10 <sup>30</sup> -11 <sup>00</sup>	Coffee break
		12 <sup>00</sup> -12 <sup>30</sup>	Coffee break	11 <sup>30</sup> -13 <sup>00</sup>	<i>Conference session (2)</i>		11 <sup>00</sup> -11 <sup>45</sup>	<b>Invited speaker Prof. Yaroslav KHIMYAK</b>
		12 <sup>30</sup> -13 <sup>30</sup>	<i>Conference session (1)</i>	13 <sup>00</sup> -13 <sup>30</sup>	<b>Prof. Vasyl SHENDEROVSKYI (special talk)</b>		11 <sup>45</sup> -12 <sup>30</sup>	<b>Invited speaker Dr. Michael GRAU</b>
13 <sup>30</sup> -14 <sup>30</sup>	Lunch	13 <sup>30</sup> -14 <sup>30</sup>	Lunch	13 <sup>30</sup> -14 <sup>30</sup>	Lunch	12 <sup>30</sup> -13 <sup>00</sup>	Coffee break	
15 <sup>00</sup> -17 <sup>00</sup>	<i>City tour (<a href="#">Ivano-Frankivsk</a>)</i>	14 <sup>30</sup> -16 <sup>00</sup>	<i>Conference session (3, 4)</i>	14 <sup>30</sup> -16 <sup>00</sup>	<i>Conference session (7, 8)</i>	13 <sup>00</sup> -13 <sup>30</sup>	<i>Conference session</i>	
18 <sup>00</sup> -19 <sup>00</sup>	Special session « <i>In memory of Professor Dmytro Freik: founder of ICPTTFN</i> » (House of Scientists, 79 Shevchenko Str.)	16 <sup>00</sup> -17 <sup>00</sup>	<i>Poster session</i> (virtual viewing of poster presentations in the participants' personal room. A special link is provided in the Conference Program)	16 <sup>00</sup> -16 <sup>45</sup>	<b>Invited speaker Dr. Lyubov TITOVA</b>	13 <sup>30</sup> -14 <sup>30</sup>	Lunch	
		17 <sup>00</sup> -17 <sup>45</sup>	<b>Invited speaker Dr. Matthew ESCARRA</b>	16 <sup>45</sup> -17 <sup>45</sup>	<i>Poster session</i> (virtual viewing of poster presentations in the participants' personal room. A special link is provided in the Conference Program)	14 <sup>30</sup> -16 <sup>00</sup>	Program Committee meeting	
		17 <sup>45</sup> -18 <sup>30</sup>	<b>Invited speaker Prof. Yuri GUREVICH</b>			16 <sup>00</sup>	<b>Conference closing ceremony</b>	
		19 <sup>00</sup> -21 <sup>00</sup>	Gala Dinner					

## ГРАФІК РОБОТИ МКФТТПН-ХІХ

Дата Година	9 жовтня, понеділок	10 жовтня, вівторок		11 жовтня, середа		12 жовтня, четвер	13 жовтня, п'ятниця	
9 <sup>00</sup> -13 <sup>30</sup>	Прибуття учасників конференції. Реєстрація	10 <sup>00</sup> -10 <sup>30</sup>	Відкриття конференції	9 <sup>00</sup> -9 <sup>45</sup>	Запрошена доповідь <b>Проф. Егон ПАВЛЦА</b>	Експурсійна програма  ( <b>Гошів</b>  <b>Бубнище</b> )	9 <sup>00</sup> -9 <sup>45</sup>	Запрошена доповідь <b>Проф. Максим СТРИХА</b>
		10 <sup>30</sup> -11 <sup>15</sup>	Запрошена доповідь <b>Проф. Зіновій ДАШЕВСЬКИЙ</b>	9 <sup>45</sup> -11 <sup>00</sup>	Секційне засідання (2)		9 <sup>45</sup> -10 <sup>30</sup>	Запрошена доповідь <b>Проф. Юрій ХАЛАВКА</b>
		11 <sup>15</sup> -12 <sup>00</sup>	Запрошена доповідь <b>Проф. Сандра ГАРДОНІО</b>	11 <sup>00</sup> -11 <sup>30</sup>	Кавова пауза		10 <sup>30</sup> -11 <sup>00</sup>	Кавова пауза
		12 <sup>00</sup> -12 <sup>30</sup>	Кавова пауза	11 <sup>30</sup> -13 <sup>00</sup>	Секційне засідання (2)		11 <sup>00</sup> -11 <sup>45</sup>	Запрошена доповідь <b>Проф. Ярослав ХІМЯК</b>
		12 <sup>30</sup> -13 <sup>30</sup>	Секційне засідання (1)	13 <sup>00</sup> -13 <sup>30</sup>	<b>Проф. Василь ШЕНДЕРОВСЬКИЙ</b> (спеціальна доповідь)		11 <sup>45</sup> -12 <sup>30</sup>	Запрошена доповідь <b>Д-р. Міхаель ГРАУ</b>
13 <sup>30</sup> -14 <sup>30</sup>	Обід	13 <sup>30</sup> -14 <sup>30</sup>	Обід	13 <sup>30</sup> -14 <sup>30</sup>	Обід		12 <sup>30</sup> -13 <sup>00</sup>	Кавова пауза
15 <sup>00</sup> -17 <sup>00</sup>	Експурсійна програма ( <b>Івано- Франківськ</b> )	14 <sup>30</sup> -16 <sup>00</sup>	Секційне засідання (3,4)	14 <sup>30</sup> -16 <sup>00</sup>	Секційне засідання (7,8)		13 <sup>00</sup> -13 <sup>30</sup>	Секційне засідання
18 <sup>00</sup> -19 <sup>00</sup>	Спеціальна секція «Вечір пам'яті Професора Дмитра Фреїка: засновника МКФТТПН» (Будинок Вчених, вул. Шевченка, 79)	16 <sup>00</sup> -17 <sup>00</sup>	Огляд та обговорення стендових доповідей (віртуальний огляд стендових доповідей у особистих кабінетах учасників. Покликання – у програмі конференції)	16 <sup>00</sup> -17 <sup>00</sup>	Запрошена доповідь <b>Д-р. Любов ТІТОВА</b>		13 <sup>30</sup> -14 <sup>30</sup>	Обід
		17 <sup>00</sup> -17 <sup>45</sup>	Запрошена доповідь <b>Д-р. Метью ЕСКАРРА</b>	17 <sup>00</sup> -18 <sup>00</sup>	Огляд та обговорення стендових доповідей (віртуальний огляд стендових доповідей у особистих кабінетах учасників. Покликання – у програмі конференції)	14 <sup>30</sup> -16 <sup>00</sup>	Засідання програмного комітету. Підбиття підсумків та прийняття рішення конференції	
		17 <sup>45</sup> -18 <sup>30</sup>	Запрошена доповідь <b>Проф. Юрій ГУРЕВИЧ</b>					
		19 <sup>00</sup> -21 <sup>00</sup>	Товариська вечера				16 <sup>00</sup>	Закриття конференції



## **CONFERENCE SESSIONS**

**On-line Zoom translation (October 10, 11, 13; 2023):**

**<https://us02web.zoom.us/j/7429741733?pwd=dWN2t4VVN0UXpWWmlnL1NtKzRoZz09>**

**Meeting ID: 742 974 1733**

**Passcode: FC=Qu4sV**

### **Засідання конференції**

**Транслюватимуться онлайн за постійно діючим покликанням,  
вказаним вище (10, 11 і 13 жовтня 2023 р.)**

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**Opening of Conference  
October, 10, 2023**

**Rector of the Vasyl Stefanyk Precarpathian National University,  
Doctor of Political Science, Professor  
Ihor TSEPENDA**

**Speech from:**

*Chairman of the Organizing Committee, Doctor of Physical and Mathematical Sciences, Professor of the Department of Materials Science and New Technologies,*

**Prof. Volodymyra BOYCHUK:**

- **International conferences on physics and technology of thin films and nanosystems. History and perspectives**

*Chair of the Scientific Committee of the conference, Ph.D., head of the department of physics and chemistry of solids*

**Prof. Lyubomyr NYKYRUY:**

- **Description of the conference sessions, program, and short statistics of the ICPTTFN-XIX**

**Відкриття конференції  
10 жовтня 2023 року**

**Вступне слово ректора  
Прикарпатського національного університету  
імені Василя Стефаника,  
доктора політичних наук, професора  
ЦЕПЕНДИ Ігора Євгеновича**

**Звернення до учасників конференції**

*голова Оргкомітету, доктор фізико-математичних наук,  
професорка кафедри матеріалознавства і новітніх технологій*  
**професорка БОЙЧУК Володимира Михайлівна:**

**Міжнародні конференції з фізики і технології тонких плівок і  
наносистем. Історія та перспективи.**

*голова наукового комітету конференції, кандидат фізико-математичних  
наук, завідувач кафедри фізики і хімії твердого тіла*

**професор НИКИРУЙ Любомир Іванович:**

**Інформація про роботу конференції, програму, секції, зареєстрованих  
учасників**



## INVITE REPORTS

1. Feasibility of high performance in AIVBVI and AVBVI nano- and polycrystalline films for thermoelectric device applications

**Prof. Zinovi DASHEVSKY,**

*Ben-Gurion University of the Negev, Beer Sheva, Israel*

[zdashev@bgu.ac.il](mailto:zdashev@bgu.ac.il)

2. Electronic and chemical surface properties of  $\text{Bi}_2\text{Se}_{3-y}\text{S}_y$ ,  $\text{Bi}_{1.993}\text{Cr}_{0.007}\text{Se}_3$  and  $\text{Bi}_2\text{MnSe}_4$  compounds

**Prof. Sandra GARDONIO**

*School of Science, Materials Research Laboratory, University of Nova Gorica, Nova Gorica, Slovenija,*

[sandra.gardonio@ung.si](mailto:sandra.gardonio@ung.si)

3. Photovoltaics and Photonics in Two Dimensions

**Dr. Matthew ESCARRA,**

*Physics and Engineering Physics Director, Micro/Nano Fabrication Facility; Tulane University, New Orleans, LA, U.S.,*

[escarra@tulane.edu](mailto:escarra@tulane.edu)

4. Charge-Carrier Transport in Thin Film Solar Cells: New Formulation

**Prof. Yuriy GUREVICH**

*Departamento de Fisica Aplicada, Universidad de Salamanca; Instituto Mexicano del Petróleo; Departamento de Fisica, CINVESTAV del I.P.N., Salamanca, Spain; Mexico, Mexico,*

[gurevich@fis.cinvestav.mx](mailto:gurevich@fis.cinvestav.mx)

5. Transient photoconductivity study of multilayered random networks of 2D material flakes casted from solution

**Prof. Egon PAVLICA**

*Laboratory of Organic Matter Physics, University of Nova Gorica, Nova Gorica, Slovenija,*

[egon.pavlica@ung.si](mailto:egon.pavlica@ung.si)

6. Terahertz spectroscopy as a window into ultrafast photocurrents and transient photoconductivity in 2D semiconductors

**Dr. Lyubov TITOVA**

*Worcester Polytechnic Institute, Worcester, MA, U.S.,*

[ltitova@wpi.edu](mailto:ltitova@wpi.edu)

7. Is it possible to create a MOSFET with a subthreshold swing lower than 60 mV per decade?

**Prof. Maksym STRIKHA**

*Taras Shevchenko Kyiv National University; V.Lashkariov Institute of Semiconductor Physics, National Academy of Sciences of Ukraine, Kyiv, Ukraine,*

[maksym.strikha@gmail.com](mailto:maksym.strikha@gmail.com)

8. Dissection of high-dimensional datasets quantifying complex biomedical systems at the molecular level

**Dr. Michael GRAU**

*University of Münster and University Hospital Münster; Philipps-Universität Marburg, Münster, Germany,*

[Michael.Grau@uni-muenster.de](mailto:Michael.Grau@uni-muenster.de)

9. Multi-layer films of polymers and semiconductor quantum dots

**Prof. Yuriy KHALAVKA**

*Department of General Chemistry and Chemistry of Materials, Yuriy Fedkovych Chernivtsi National University, Chernivtsi, Ukraine,*

[y.khalavka@chnu.edu.ua](mailto:y.khalavka@chnu.edu.ua)

10. Understanding of nanoscale organisation of pharmaceutical solids and biomaterials

**Prof. Yaroslav KHIMYAK**

*University of East Anglia, Norwich, United Kingdom,*

[Y.Khymyak@uea.ac.uk](mailto:Y.Khymyak@uea.ac.uk)

# ORAL REPORTS

## Session 1

### Thin films technology (metals, semiconductors, dielectrics, conductive polymers) and their research methods

#### **Advanced Nanoindentation in Vanadium Oxide Characterizations**

Lytvyn P.M., Dzhagan V.M., Valakh M.Ya., Korchovyi A.A., Isaieva O.F., Stadnik O.A., Yukhymchuk V.O., Gudymenko O.Yo., Romanyuk B.M., Melnik V.P.

(V. Lashkaryov Institute of Semiconductors Physics, NAS of Ukraine, Kyiv, Ukraine; [peter.lytvyn@ccu-semicond.net](mailto:peter.lytvyn@ccu-semicond.net))

#### **Conduction Mechanisms in Amorphous SiCN Films**

Tkachuk A., Tetyorkin V.V., Porada O.K.

(V. Lashkaryov Institute of Semiconductor Physics, NAS Ukraine, Kyiv, Ukraine; V. Vynnychenko Central Ukrainian State University, Kropyvnytskyi, Ukraine; Institute for Problems of Materials Sciences NAS of Ukraine, Kyiv, Ukraine; [atkachuk08@meta.ua](mailto:atkachuk08@meta.ua))

#### **Effect of substrate bias on the properties of Al-doped ZnO films deposited by magnetron sputtering**

Ievtushenko A.I., Karpyna V.A., Bykov O.I., Olifan O.I., Mamykin S.V., Kolomys O.F., Strelchuk V.V., Lytvyn P.M., Korchovyi A.A., Tkach V.M., Starik S.P., Baturin V.A., Karpenko O.Y.

(I. Frantsevich Institute for Problems of Material Science, NASU, Kyiv, Ukraine, [a.ievtushenko@yahoo.com](mailto:a.ievtushenko@yahoo.com); V. Lashkarev Institute of Semiconductor Physics, NASU, Kyiv, Ukraine; V. Bakul Institute for Superhard Materials, NASU, Kyiv, Ukraine; Institute of Applied Physics, NASU, Sumy, Ukraine)

#### **Problems of creation laser-induced thin films**

Trokhimchuck P.

(Lesya Ukrainka Volyn National University, Lutsk, Ukraine; [Trokhimchuck.Petro@vnu.edu.ua](mailto:Trokhimchuck.Petro@vnu.edu.ua))

#### **Structural and phase transformations in vanadium oxide under the ultrasound loading**

Tymochko M., Melnik V.P., Dubikovskiy O.V., Olikh Ya.M., Romanyuk B.M., Lepikh Ya.I.

(V.E. Lashkaryov Institute of Semiconductor Physics NAS of Ukraine, Kyiv, Ukraine; [tymochko@ukr.net](mailto:tymochko@ukr.net); I.I. Mechnikov National University Odessa, Ukraine, [ndl\\_lepikh@onu.edu.ua](mailto:ndl_lepikh@onu.edu.ua))

**Session 2**  
**Nanotechnologies and nanomaterials, quantum-size structures**

**Controlling by defects of switching of ZnO nanowire array surfaces from hydrophobic to hydrophilic**

Stepanyuk A., Balabai R.

(*Kryvyi Rih State Pedagogical University, Kryvyi Rih, Ukraine;*  
[alexanderstepanyuk@gmail.com](mailto:alexanderstepanyuk@gmail.com))

**Doping-induced phase separation in (Cd,Cr)Te magnetic materials**

Popovych, V.D., Dluzewski, P., Morawiec, K., Zajkowska, W., Popovych A.V., Stolyarchuk, I.D., Hadzaman, I.V., Żywczak, A., Kuzma M., Shiojiri M.

(*Ivan Franko Drohobych State Pedagogical University, Drohobych, Ukraine,*  
[vpopovych@dspu.edu.ua](mailto:vpopovych@dspu.edu.ua); *The John Paul II Catholic University of Lublin, Lublin, Poland; Institute of Physics, Polish Academy of Science, Warsaw, Poland; AGH University of Science and Technology, Krakow, Poland; University of Rzeszow, Rzeszow, Poland; Kyoto Institute of Technology, Kyoto, Japan*)

**Effect of electric field of the electron and hole energy spectra of non-concentric spherical core-shell quantum dot**

Leshko R., Leshko O.V.

(*Drohobych Ivan Franko State Pedagogical University, Drohobych, Ukraine;*  
[leshkoroman@gmail.com](mailto:leshkoroman@gmail.com))

**Electrophysical properties of manganese dioxide various modifications and composites based on  $\alpha$  - MnO<sub>2</sub>/C and  $\beta$  - MnO<sub>2</sub>/C**

Kolkovskyy P.I., Rachiy B.I., Kolkovska H.M., Ivanichok O.M., Bushkova V.S.

(*V. I. Vernadsky Institute of General and Inorganic Chemistry, Kyiv, Ukraine;*  
[PKolkovskyy@gmail.com](mailto:PKolkovskyy@gmail.com); *Vasyl Stefanyk Precarpathian National University, Ivano-Frankivsk, Ukraine*)

**Manipulating the band-gap value of phosphorene for straintronics application**

Solomenko A.G., Sahalianov I.Y., Radchenko T.M., Tatarenko V.A.

(*G.V.Kurdyumov Institute for Metal Physics, N.A.S. of Ukraine, Kyiv, Ukraine;*  
*Linköping University, Norrköping, Sweden;* [sola@imp.kiev.ua](mailto:sola@imp.kiev.ua))

## **Nanomaterials for application in Nuclear Forensics**

Vasylyeva H.

(Uzhhorod National University, Uzhhorod, Ukraine;  
[h.v.vasylyeva@hotmail.com](mailto:h.v.vasylyeva@hotmail.com))

## **Structuring of (111) PbTe crystal surfaces sputtering with Ar<sup>+</sup> ions and self-organization processes**

Zayachuk D.M.

(Lviv Polytechnic National University, Lviv, Ukraine; [zayachuk@polynet.lviv.ua](mailto:zayachuk@polynet.lviv.ua))

## **Synthesis of ferromagnetic nanoparticles for use as contrast agents for long-term magnetic resonance molecular imaging**

Kotsyubynsky A.O., Hrytsuliak H.M., Kotsyubynska Y.Z.

(Vasyl Stefanyk Precarpathian National University, Ivano-Frankivsk, Ukraine; [kotsyubynskyao@gmail.com](mailto:kotsyubynskyao@gmail.com); Ivano-Frankivsk National Technical University of Oil and Gas, Ivano-Frankivsk, Ukraine, [grytsulyaka@ukr.net](mailto:grytsulyaka@ukr.net); Ivano-Frankivsk National Medical University, Ukraine, [kotsyubynskayz@gmail.com](mailto:kotsyubynskayz@gmail.com))

## **Theory of superlattices with two atoms in the basis**

Bandura H., Bilynskyi I.V., Leshko R.Ya.

(Kryvyi Rih State Pedagogical University, Kryvyi Rih, Ukraine; Drohobych Ivan Franko State Pedagogical University, Drohobych, Ukraine; [galinka.bandura@gmail.com](mailto:galinka.bandura@gmail.com))



**Session 3**  
**Physical-chemical properties of thin films**

**Effect of B<sub>2</sub>O<sub>3</sub> addition to Magnesium, Zirconium, Hafnium fluorides on the parameters of thin films formed from them**

Zinchenko V.F., Mozkova O.V., Magunov I.R., Volchak G.V., Ieriomin O.G., Babenko A.V.

*(Bogatsky Physico-Chemical Institute NAS of Ukraine, Odesa, Ukraine; State Enterprise for Special Instrument Making «Arsenal», Kyiv, Ukraine; [vfzinchenko@ukr.net](mailto:vfzinchenko@ukr.net))*

**Quantum size effects in thin films of V<sub>2</sub>VI<sub>3</sub> topological insulators**

Rogachova O.I.

*(National technical university "Kharkiv polytechnic institute", Kharkiv, Ukraine; [rogachova.olen@gmail.com](mailto:rogachova.olen@gmail.com))*

**Synthesis and study of properties of emulsion polishes based on beeswax and carnauba wax**

Kurta S.A., Aliyeva A.E.

*(Vasyl Stefanyk Precarpathian National University, Ivano-Frankivsk, Ukraine; [kca2014@ukr.net](mailto:kca2014@ukr.net))*

**Session 7**  
**Nanomaterials for biomedical application**

**Copper single-phase ferrite nanoparticles as promise materials for magnetic hyperthermia application**

Mazurenko Yu., Kaykan L., Moiseienko M., Kuzyshyn M., Vytvytskyi A.  
(*Ivano-Frankivsk National Medical University, Ivano-Frankivsk, Ukraine;*  
[yumazurenko@ifnmu.edu.ua](mailto:yumazurenko@ifnmu.edu.ua); *G.V. Kurdyumov Institute for Metal Physics, N.A.S. of Ukraine, Kyiv, Ukraine*)

**Development of optical immunosensors based on TiO<sub>2</sub> thin films**

Tereshchenko A.  
(*Odesa National I.I.Mechnikov University, Odesa, Ukraine;*  
[alla.teres50@gmail.com](mailto:alla.teres50@gmail.com))

**Interactions of human serum albumin with II-VI based semiconductor quantum dots probed by optical spectroscopy methods**

Stolyarchuk I.V., Kuzyk O.V., Dan'kiv O.O., Stolyarchuk A.I., Pryima Yu.A.,  
Wojnarowska-Nowak R.  
(*Drohobych Ivan Franko State Pedagogical University, Drohobych, Ukraine;*  
*University of Rzeszow, Rzeszow, Poland ;*[i.stolyarchuk@dspu.edu.ua](mailto:i.stolyarchuk@dspu.edu.ua))

**Session 8**  
**Innovative methods for teaching**

**Discoverer of cold emission in island metal films** (*Ukrainian physicist Petro Borziak. 120<sup>th</sup> anniversary*)

Schenderovskyj V., Kozyrski W., Polevetska O.,  
(*Institute of Physics, Ukrainian National Academy of Sciences, Kyiv, Ukraine;*  
[polev.ov@ukr.net](mailto:polev.ov@ukr.net); *N. Bogolubov Inst. for Theoretical Physics, Ukrainian National Academy of Sciences, Kyiv, Ukraine*)

## POSTER REPORTS

### Session 1

#### **Thin films technology (metals, semiconductors, dielectrics, conductive polymers) and their research methods**

##### **CdS Thin Films as Window Layer for Photovoltaic Application**

Katanova Liliia, Nykyruy Lyubomyr, Saliy Yaroslav, Yavorskyi Rostyslav, Yavorskyi Yaroslav, Matkivskyi Ostap, Naidych Bohdana

(*Vasyl Stefanyk Precarpathian National University, Ivano-Frankivsk, Ukraine;*  
[lilia.katanova@pnu.edu.ua](mailto:lilia.katanova@pnu.edu.ua))

##### **Change in microhardness of amorphous metal alloys based on Aluminium due to corrosion**

Khrushchuk Kh., Julian Kubisztal, Adrian Barylski, Mirosław Grzegorzolka, Malgorzata Karolus

(*Ivan Franko National University of Lviv, Faculty of Chemistry, Department of Physical and Colloid Chemistry, Lviv, Ukraine; University of Silesia in Katowice, Institute of Materials Engineering, Faculty of Science and Technology, Chorzow, Poland;* [khrystyna.khrushchuk@us.edu.pl](mailto:khrystyna.khrushchuk@us.edu.pl))

##### **Cross sections of absorption and scattering by metal truncated spheres and segments located on a dielectric substrate**

Korotun A.V., Rubish V.M.

(*National University Zaporizhzhia Politechnic, Zaporizhzhia, Ukraine; G.V. Kurdyumov Institute for Metal Physics of the NAS of Ukraine, Kyiv, Ukraine; Institute for Information Recording, NAS of Ukraine, Uzhgorod, Ukraine;*  
[center.uzh@gmail.com](mailto:center.uzh@gmail.com))

##### **Defect structure and magnetic properties of thin and thick yttrium iron garnet epitaxial systems**

Fodchuk I., Hutsuliak I., Dovganyuk V., Kuzmin A., Solodkyi M., Roman Y., Lytvynchuk I., Okolita M.

(*Yury Fedkovych Chernivtsi National University, Chernivtsi, Ukraine;*  
[i.fodchuk@ukr.net](mailto:i.fodchuk@ukr.net))

##### **Developing and programming the algorithm for X-ray diagnostics of the structure of near-surface layers in ion-implanted monocrystalline materials**

Yaremii I.P., Yaremii H.I., Vekeryk D.V.

(*Vasyl Stefanyk Precarpathian National University, Ivano-Frankivsk, Ukraine;*  
[yaremiyip@pnu.edu.ua](mailto:yaremiyip@pnu.edu.ua))

**Effect of chemical treatment on electrophysical characteristics of In/p-PbTe/In structures**

Malanych G., Tomashyk V.M.

*(V. Ye. Lashkaryov Institute of Semiconductor Physics, National Academy of Sciences of Ukraine, Kyiv, Ukraine; [galya.malanich@gmail.com](mailto:galya.malanich@gmail.com))*

**Fast and slow components of ferroelectric polarization during its switching in PVDF films**

Fedosov S., Sergeeva A. E., Klimenko I. M.

*(Odesa National University of Technology, Odesa, Ukraine; [snfedosov@ukr.net](mailto:snfedosov@ukr.net))*

**Investigation of Cadmium Telluride photovoltaic absorber layer**

Yavorskyi R.<sup>1</sup>, Nykyruy L.<sup>1</sup>, Zamurueva O.<sup>2</sup>, Naidych B.<sup>1</sup>, Semko T.<sup>1</sup>, Mateik H.<sup>3</sup>

*(<sup>1</sup>Vasyl Stefanyk Precarpathian National University, Ivano-Frankivsk, Ukraine, [r.yavorskyi@pnu.edu.ua](mailto:r.yavorskyi@pnu.edu.ua); <sup>2</sup>Volyn National University, Lutsk, Ukraine; <sup>3</sup>Ivano-Frankivsk National University of Oil and Gas, Ivano-Frankivsk, Ukraine)*

**Low temperature technologies of deposition of aluminium nitride films**

Rashkovetskyi L.V., Plyatsko S.V., Gromovyi Yu.S., Liptuga A.I., Svezhentsova K.V.<sup>1</sup>, Petryk I.

*(ISP NAS of Ukraine, Kyiv, Ukraine; O.O. Chuiko Institute of Surface Chemistry NAS of Ukraine; [rashlv@ukr.net](mailto:rashlv@ukr.net))*

**Low-temperature charge transport in nanosized gold films**

Apoppi V., Bihun R.

*(Ivan Franko Lviv national University, Lviv, Ukraine; [viktor.apoppi@lnu.edu.ua](mailto:viktor.apoppi@lnu.edu.ua))*

**Modeling of antireflective gradient films based on porous Si**

Politanskyi R., Vistak M.V., Kogut I.T., Mykytyuk Z.M., Shymchyshyn O.Y., Diskovskyi I.S.

*(Yurii Fedkovych Chernivtsi National University, Chernivtsi, Ukraine; Danylo Halytsky Lviv National University, Lviv, Ukraine, [vistak\\_maria@ukr.net](mailto:vistak_maria@ukr.net); Vasyl Stefanyk Precarpathian University, Ivano-Frankivsk, Ukraine; National University Lviv Polytechnic, Lviv, Ukraine)*

**Obtaining of carbon nanomaterials on thin films of Ni/Cr and Fe catalysts by deposition from a gaseous mixture of carbon monoxide and hydrogen**

Filonenko D.S.<sup>1</sup>, Khovavko A.I.<sup>1</sup>, Nebesnyi A.A.<sup>1</sup>, Sviatenko A.M.<sup>1</sup>,  
Barabash M.Yu.<sup>1,2,3</sup>

(<sup>1</sup>The Gas Institute of the National Academy of Sciences of Ukraine, Kyiv, Ukraine, [ingaskiev@gmail.com](mailto:ingaskiev@gmail.com); <sup>2</sup>Technical Center of the National Academy of Sciences of Ukraine, Kyiv, Ukraine [mbarabash@nasu.kiev.ua](mailto:mbarabash@nasu.kiev.ua); <sup>3</sup>National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Kyiv, Ukraine)

### **Optimization of the poling field for obtaining uniform polarization in ferroelectric polymer thin films**

Fedosov S., Sergeeva A. E., Kichuk S. V.

(Odesa National University of Technology, Odesa, Ukraine; [snfedosov@ukr.net](mailto:snfedosov@ukr.net))

### **Pulsed laser deposition of thin films of chalcogenide semiconductors for optoelectronics**

Virt I.S., Potera P., Cieniek B.

(Drohobych State Pedagogical University I.Franko, Drohobych, Ukraine; University of Rzeszow, Poland; [isvirt@email.ua](mailto:isvirt@email.ua))

### **Shape and Location of Charge Carriers in Linear, Branched and Curved $\pi$ -Electron Carbon Systems**

Gaponov A., Pavlenko O.L., Dmytrenko O.P., Kulish M.P., Naumenko A.P. and Kachkovsky A.D.

(Taras Shevchenko National University of Kyiv, Kyiv, Ukraine; [antongaponov@ukr.net](mailto:antongaponov@ukr.net); Institute of Bioorganic Chemistry and Petrochemistry, National Academy of Sciences, 1 Murmanska Str., Kyiv, Ukraine)

### **Strain analysis of diamond crystals by the power Fourier spectrum of Kikuchi patterns**

Borcha M., Fodchuk I., Solodkyi M., Balovsyak S., Kuzmin A., Hutsuliak I., Tkach O., Unhurian M.

(Yury Fedkovych Chernivtsi National University, Chernivtsi, Ukraine; [m.borcha@chnu.edu.ua](mailto:m.borcha@chnu.edu.ua))

### **Structural and morphological studies of films formed in the process of gas-detonation deposition of hydroxyapatite onto polymer substrates**

Dzhagan V., Yukhymchuk V.O., Temchenko V.P., Lozynskyi V.B., Karnaukhov A.V., Isaieva O.F., Vorona I.P., Valakh M.Ya., Belyaev A.E.

(V. Lashkaryov Institute of Semiconductors Physics, National Academy of Sciences of Ukraine, Kyiv, Ukraine; [dzhagan@isp.kiev.ua](mailto:dzhagan@isp.kiev.ua))

## **Synthesis and morphology characterization of electrocatalytic Mo-rich alloys**

Bersirova O.<sup>1,2</sup>, Cesiulis H.<sup>1</sup>

*(<sup>1</sup>Department of Physical Chemistry, Vilnius University, Vilnius, Lithuania;*

*<sup>2</sup>V.I.Vernadsky Institute of General and Inorganic Chemistry of NAS of Ukraine, Kyiv, Ukraine; [bersibol@ukr.net](mailto:bersibol@ukr.net))*

## **The influence of substrate type on the structural and optical properties of solid solutions CdTe<sub>1-x</sub>Se<sub>x</sub>**

Vashchynskiy V., Ilchuk H.A., Semkiv I.V., Solovyov M.V., Karkulovska M.S.

*(Lviv Polytechnic National University, Lviv, Ukraine; [v.vashchynskiy@gmail.com](mailto:v.vashchynskiy@gmail.com))*

## **The influence of the transition layer of CdTe:Cl/MoO<sub>x</sub> heterostructures on the electrical and spectroscopic properties of detector systems**

Fodchuk I.M., Kuzmin A.R., Balovsyak S.V., Hutsuliak I.I., Solodkyi M.S.

*(Yury Fedkovych Chernivtsi National University, Chernivtsi, Ukraine; [i.fodchuk@ukr.net](mailto:i.fodchuk@ukr.net))*

## **Thin Ag films as transparent conductors**

Bihun R.I., Penyukh B.R., Apopii V.H., Koman B.P., Kalivoshka B.M.

*(Ivan Franko Lviv state university, Lviv, Ukraine; [bihun28@ukr.net](mailto:bihun28@ukr.net))*

**Session 2**  
**Nanotechnologies and nanomaterials, quantum-size structures**

**Conductive and capacitive properties of InSe<SmCl<sub>3</sub>> Nanohybrid**

Maksymych V., Chabecki P., Shvets R.

*(Ivan Franko National University of Lviv, Lviv, Ukraine; Politechnika Czesłochowska, Czesłochowa, Poland; Lviv Polytechnic National University, Lviv, Ukraine; [vitalii.maksymych@lnu.edu.ua](mailto:vitalii.maksymych@lnu.edu.ua))*

**Effect of the graphene oxide doping on the electrical properties of poly(6-aminoinsole)**

Horbenko Yu., Aksimentyeva O.I., Kovalskiy Y .P.

*(Ivan Franko National University of Lviv, Lviv, Ukraine; [yuliia.horbenko@lnu.edu.ua](mailto:yuliia.horbenko@lnu.edu.ua))*

**Electrochemical behavior of the activated carbon/ZnMn<sub>2</sub>O<sub>4</sub> system in an aqueous electrolyte**

Ivanichok N., Kolkovskiy P.I., Ivaniv I.I., Rachiy B.I., Borchuk D.S., Kovtonyuk V.A.

*(Vasyl StefanykPrecarpathian National University, Ivano-Frankivsk, Ukraine; V.I. Vernadsky Institute of General and Inorganic Chemistry, Kyiv, Ukraine; [natalia.ivanichok@pnu.edu.ua](mailto:natalia.ivanichok@pnu.edu.ua))*

**Electrochemical properties of carbon biocomposites**

Moklyak M., Hrubciak A.B., Moklyak V.V., Ostafyichuk B.K.

*(Vasyl StefanykPrecarpathian National University, Ivano-Frankivsk, Ukraine; V.I. Vernadsky Institute of General and Inorganic Chemistry, Kyiv, Ukraine [bogdan.rachiy@pnu.edu.ua](mailto:bogdan.rachiy@pnu.edu.ua))*

**Electrochemical properties of nanoporous carbon materials obtained from waste coffee grounds**

Rachiy B.I., Ivanichok N.Ya., Kolkovskiy P.I., Soltys A.M., Yablon L.S., Mandzyuk V.I., Khrushch L.Z., Voitkiv H.V.

*(Vasyl StefanykPrecarpathian National University, Ivano-Frankivsk, Ukraine; G.V. Kurdyumov Institute for Metal Physics, N.A.S. of Ukraine; [mariamoklyak@gmail.com](mailto:mariamoklyak@gmail.com))*

**Electronic energy structure of the (100) In<sub>4</sub>Se<sub>3</sub> surfaces by deferring preparation and treatment in UPS study**

Galiy P., Makar T.R., Dzyuba V.I., Nenchuk T.M., Tuziak O.Ya.

*(Pidstryhach Institute for Applied Problems of Mechanics and Mathematics of NAS of Ukraine, Lviv, Ukraine; Ivan Franko Lviv National University, Physics Department, Lviv, Ukraine, [pavlo.galiy@lnu.edu.ua](mailto:pavlo.galiy@lnu.edu.ua))*

### **Emission spectroscopy of porous-Si/c-Si heterostructures' surfaces**

Poplavskyy O.P., Galiy P.V., Nenchuk T.M., Tsvetkova O.V., Tuziak O.Ya.

*(Vasyl Stefanyk Precarpathian National University, Ivano-Frankivsk, Ukraine; Ivan Franko National University of Lviv, Lviv, Ukraine; [pavlo.galiy@lnu.edu.ua](mailto:pavlo.galiy@lnu.edu.ua))*

### **Energy subsystem of porous carbon material after laser radiation**

Budzulyak I.M., Iablon L.S., Panko I.I., Lyzun Eu.V.

*(Vasyl Stefanyk Precarpathian National University, Ivano-Frankivsk, Ukraine; [ivan.budzuliak@pnu.edu.ua](mailto:ivan.budzuliak@pnu.edu.ua))*

### **Ethylene Glycol Functionalized nZVI Nanoparticles**

Turovska L.V., Boychuk V.M., Moiseienko M.I., Kotsyubynska Y.Z., Shurpa M.S.

*(Vasyl Stefanyk Precarpathian National University, Ivano-Frankivsk, Ukraine; Ivano-Frankivsk National Medical University, Ivano-Frankivsk, Ukraine; [lturovska@ifnmu.edu.ua](mailto:lturovska@ifnmu.edu.ua))*

### **Features of plasmon resonance exciting of silver nanoparticles due to pre-treatments with different duration in magnetic field**

Redko R., Shvalagin V.V., Milenin G.V, Redko S.M., Savchuk Y.M.

*(V. Lashkaryov Institute of Semiconductor Physics of the National Academy of Sciences of Ukraine, Kyiv, Ukraine; L. Pysarzhevskii Institute of Physical Chemistry of the National Academy of Sciences of Ukraine, Kyiv, Ukraine; [redko.rom@gmail.com](mailto:redko.rom@gmail.com))*

### **Ferrite materials and their synthesis by the sol-gel autocombustion method**

Yaremiy I.P., Yaremiy S.I., Bushkova V.S., Burdiak V.R., Savchyn V.V., Andriichuk O.P.

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### **Fractal structure of thermoactivated nanoporous carbon materials**

Mandzyuk V., Lisovskiy, R.P., Rachiy, B.I.

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## **Gadolinium-Decorated Multiwalled Carbon Nanotubes: Synthesis and Characterization**

Abaszade R.G.<sup>1\*</sup>, Aliyev E.M.<sup>2</sup>, Margitych T.O.<sup>4</sup>, Stetsenko M.O.<sup>5,6</sup>, Kotsyubynsky V.O.<sup>3</sup>

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## **Hybridization of Dipole Plasmonic Modes in Metallic Nanoshells of Variable Thickness**

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## **Impact of duration shock-vibration treatment on the structural parameters of nanocomposite SiO<sub>2</sub>/Al<sub>2</sub>O<sub>3</sub>**

Yurii Yavorskyi, Andrii Hrubciak, Myroslav Karpets, Olexander Dudka

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## **Interband absorption of light in a spheroidal quantum dot with consideration of polarization phonons**

Holskyj V., Leshko R.Ya., Holska S.V., Karpiy V.R.

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## **Metal Oxide Nanopowders: Synthesis and Applications in Gas Sensors**

Popovych D., Venhryn Yu.I., Savka S.S., Bovhyra R.V., Zhyrovetsky V.M., Serednytski A.S.

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## **Ni(OH)<sub>2</sub> nanoparticles as an efficient electrocatalyst for hydrogen evolution under alkaline conditions**

Solonets D., Kotsyubynsky V.O. Boychuk V.M., Klymyuk M.M.

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### **Organic-inorganic nanocomposites for absorption of electromagnetic radiation**

Rachiy B.I., Ivanichok N.Ya., Kolkovskiy P.I., Soltys A.M., Yablon L.S., Mandzyuk V.I., Khrushch L.Z., Voitkiv H.V.

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### **Periodic nanostructures induced by point defects in $Pb_{1-x}Sn_xTe$**

Horichok I.<sup>1</sup>, Saliy Ya.<sup>1</sup>, Nykyruy L.<sup>1</sup>, Cempura G.<sup>2</sup>, Parashchuk T.<sup>2</sup>, Rechkin A.<sup>1</sup>, Balan V.<sup>1</sup>

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[ihor.horichok@pnu.edu.ua](mailto:ihor.horichok@pnu.edu.ua); <sup>2</sup>AGH University of Science and Technology, Krakow, Poland)*

### **Photoluminescence efficiency of the Si – nanocrystalline CdTe composite**

Trishchuk L., Trishchuk R.L., Pashchenko G.A., Tomashyk V.M.

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### **Plasmons in a chain of spheroidal metal nanoparticles located on a dielectric substrate**

Maniuk M., Korotun A., Titov I.

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G.V.Kurdyumov Institute for Metal Physics of the NAS of Ukraine, Kyiv, Ukraine;  
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### **Proton-induced secondary electron emission from ZnO nanorods grown on GaN substrate: Geant4 modeling**

Kindrat V., Shlihutka B.T., Ivanyshyn I.P., Goy V.T.

*(Vasyl Stefanyk Precarpathian National University, Ivano-Frankivsk, Ukraine;  
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### **Raman spectroscopy study on $Cu_2XSnS_4$ (X=Zn,Fe,Co,Ni) nanocrystals synthesized by colloidal chemistry**

Mazur N.V.<sup>4</sup>, Ivakhno-Tshehlynyk O.<sup>1,2</sup>, Selyshchev O.V.<sup>1,2</sup>, Kotsyubynsky V.O.<sup>3</sup>, Boychuk V.M.<sup>3</sup>, Dzhagan V.M.<sup>4</sup>, Havryliuk Ye.O.<sup>1,2,4</sup>, Kondratenko S.V.<sup>5</sup>, Yukhymchuk V.O.<sup>4</sup>, Zahn D.R.T.<sup>1,2</sup>

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### **Rapid one-pot synthesis of ultrafine CuFe<sub>2</sub>O<sub>4</sub>-rGO hybrid nanomaterials**

Zapukhlyak R.I., Kotsyubynsky V.O., Boychuk V.M., Homenyuk I.I., Trautwein A.A.

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### **Reflection of nanowires and porous silicon**

Onyshchenko V.

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### **SAXS Study of Reduced Graphene Oxide obtained by Hummers` Method**

Bandura Kh.V.<sup>1</sup>, Kotsyubynsky V.O.<sup>2</sup>, Boichuk V.M.<sup>2</sup>, Mazurenko J.S.<sup>1</sup>

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### **Selective laser sintering of amorphous nanoparticles: Molecular dynamics simulations**

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### **Structural and electronic properties of LiH<sub>3</sub>(SeO<sub>3</sub>)<sub>2</sub> crystals**

Kovalenko M., Bovgyra O., Onysko M.

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### **Surface plasmons in metal-graphene cylinders**

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**Synthesis and characterization of plasmonic nanoparticles of different shape for biomedical applications**

Mazur N.V.<sup>1</sup>, Kapush O.A.<sup>1</sup>, Ivanova I.V.<sup>2</sup>, Yukhymchuk V.O.<sup>1</sup>, Sydorenko V.G.<sup>2</sup>, Kukla O.L.<sup>1</sup>, Demydov P.V.<sup>1</sup>, Moroz O.F.<sup>3</sup>, Soloviev A.I.<sup>2</sup>, Zholos A.V.<sup>3</sup>, Dzhagan V.<sup>1</sup>

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**Synthesis, structure and photocatalytic activity of Mn-doped titania**

Mykytyn I., Myronyuk I.F., Kotsyubynsky V.O., Boychuk V.M., Frolyak V.Y.  
(*Vasyl Stefanyk Precarpathian National University, Ivano-Frankivsk, Ukraine; [ihor.mykytyn@pnu.edu.ua](mailto:ihor.mykytyn@pnu.edu.ua)*)

**The effect of the mechanical duration on the electronic structure SiO<sub>2</sub>/TiO<sub>2</sub> nanocomposite**

Yavorskyi Yu., An Tianchang, Gou Yulong, Zaulychnyy Ya.  
(*Igor Sikorski Kyiv Polytechnic Institute, Kyiv, Ukraine; [yar-yra@ukr.net](mailto:yar-yra@ukr.net)*)

**The spatial redistribution of point defects and their self-organization in the ZnO semiconductor under the influence of pulsed laser irradiation**

Peleshchak R.M., Kuzyk O., Dan'kiv O.O., Stolyarchuk I.D., Kuhivchak V.A. and Revutskyi O.O.

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**Session 3**  
**Physical-chemical properties of thin films**

**Catalytic activity of amorphous metallic electrodes in redox processes of films of oligomeric peroxides**

Hula T., Hertsyk O.M., Kovbuz M.O., Pandiak N.L.

*(Ivan Franko National University of Lviv, Lviv, Ukraine; Ukrainian National Forestry University, Lviv, Ukraine; [djunjer1@gmail.com](mailto:djunjer1@gmail.com))*

**Dispersion properties of  $(\text{La}_{0.06}\text{Ga}_{0.94})_2\text{O}_3:\text{Eu}$  thin films**

Bordun O., B.O. Bordun, I.Yo. Kukharsky, I.I. Medvid, I.M.Kofliuk, D.M.Maksymchuk

*(Ivan Franko National University of Lviv, Lviv, Ukraine; [oleh.bordun@lnu.edu.ua](mailto:oleh.bordun@lnu.edu.ua))*

**Doping of CdTe with Li impurity**

Mazur T.M., Mateik G.D.

*(Ivano-Frankivsk National Technical University of Oil and Gas, Ivano-Frankivsk, Ukraine; [tetiana.mazur@nung.edu.ua](mailto:tetiana.mazur@nung.edu.ua))*

**Electrochemical impedance spectroscopy study of thin films with insulating and anticorrosion properties on Cobalt-based amorphous alloys**

Lopachak M., Boichyshyn L., Reshetnyak O.

*(Ivan Franko National University of Lviv, Lviv, Ukraine; [mariia.lokachak@lnu.edu.ua](mailto:mariia.lokachak@lnu.edu.ua))*

**Electron-Stimulated Desorption and Thermodesorption from MgO Film Surfaces**

O.P. Poplavskyy, I.M. Lishchynskyy, I.O. Poplavskyy

*(Vasyl Stefanyk Precarpathian National University, Ivano-Frankivsk, Ukraine; [igor.lishchynskyy@pnu.edu.ua](mailto:igor.lishchynskyy@pnu.edu.ua))*

**Features of In doping on spectral properties of CdTe thin films**

Vakaliuk I.V., Nykyruy L.I., Yavorskyi R.S., Fedosov S.A., Hrytsyak M.D., Ilitskyi R.V.

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**Influence of the Toxic Vapors on the Electrical Properties and Structure of Polytoluidine Films**

Aksimentyeva O.I., Tsizh B.R., Horbenko Yu.Yu., Chokhan' M.I., Stepura A.L., Baluk V.I.

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### **Investigating Anisotropy Effects in Dislocation Loops Formation in Garnet Structure Materials**

Tomyn Y., Yaremiy I.P., Yaremiy S.I.

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### **Investigation of CdSe<sub>1-x</sub>S<sub>x</sub> solid solutions thin films obtained by magnetron sputtering method**

Karkulovska M.S., Ilchuk H.A., Semkiv I.V., Vashchynskyi V.M., Solovyov M.V.

(*Lviv Polytechnic National University, Lviv, Ukraine; [mariana.s.karkulovska@lpnu.ua](mailto:mariana.s.karkulovska@lpnu.ua)*)

### **Ion Intercalation in Two-Dimensional Titania Sheets for Batteries**

Prykhozha Yu., Balabai R.

(*Kryvyi Rih State Pedagogical University, Kryvyi Rih, Ukraine; [prihozhaya.yuliya93@gmail.com](mailto:prihozhaya.yuliya93@gmail.com)*)

### **Light emitters based on GaN**

Slyotov M.M., Slyotov O.M., Potsiluiko-Hryhoriak G.V.

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### **Optical properties of GaN/Al<sub>2</sub>O<sub>3</sub> thin films doped with silicon**

Gentsar P.O., Mynaylo A. M., Pekur D.V., Demchyna L.A., Stronski A.V., Zayats N.S., Vlasenko O.I.

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### **Peculiarities of obtaining and interpretation of multifractal spectra during analysis surfaces of superthin semiconductor layers**

Skyba G., Balytska N.O., Moskvin P.P., Rashkovetskyi L.V.

*(Zhytomyr Polytechnic State University, Zhytomyr, Ukraine; Institute of Physics of Semiconductors, National Academy of Science of Ukraine, Kyiv, Ukraine; [skybagalyna26@gmail.com](mailto:skybagalyna26@gmail.com))*

**Raman evidence for the oxidation of amorphous arsenic chalcogenide film surface under visible light**

Azhniuk Yu., Lopushansky V.V., Gomonnai A.V., Solonenko D., Loya V.Y., Kryshenik V.M., Voynarovych I.M., Zahn D.R.T.

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**Raman study of thin  $\text{TiInS}_2$  films prepared by thermal evaporation**

Azhniuk Yu., Gomonnai A.V., Lopushansky V.V., Gomonnai O.O., Babuka T., Loya V.Y., Voynarovych I.M.

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**Stripping voltammetry of nanoscale films of alloys of the Zn-Ni-Cu system**  
Maizelis A.

*(National Technical University "Kharkiv Polytechnic Institute", Kharkiv, Ukraine; [a.maizelis@gmail.com](mailto:a.maizelis@gmail.com))*

**Structural properties of Ga-Ge-Te alloys**

Popovych M.V., Stronski A.V., Shportko K.V.

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**Structure and resistance of mercury modified  $\text{SbxSe}_{100-x}$  amorphous films**

Boryk V.V., Dzumedzey R.O., Durkot M.O., Makar L.I., Pisak R.P., Pop M.M., Rubish V.M., Solomon A.M.

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**Study of structure and phase transition in vanadium oxide thin films by Raman spectroscopy**

Dzhagan V., Isaieva O.F., Yukhymchuk V.O., Stadnik O.A., Gule E.G., Maksimenko Z.V., Lytvyn P.M., Dubikovskiy O.V., Melnik V.P., Romanyuk B.M., Valakh M.Ya.

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**The semiconductor-dielectric transition in Ge/Ge<sub>(x)</sub>Si<sub>(1-x)</sub> films**

Luniov S., Shygorin P.P., Venhryn B.Ya.

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## Session 4

### Thin film compounds for electronic devices, nanoelectronics

#### Deep levels in spin-coated MoS<sub>2</sub> films

Kondratenko S.V.<sup>1</sup>, Datsenko O.I.<sup>1</sup>, Kovanzhi P.O.<sup>1</sup>, Mykytiuk A.A.<sup>1</sup>,  
Dzhagan V.M.,<sup>1,2</sup> Zahn D. R. T.<sup>3</sup>

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#### Effect of MXene interfacial layer on the field-effect mobility of a bottom-gate indacenodithiophene–benzothiadiazole copolymer field-effect transistor

Urbančič J., Bratina G., Pavlica E.

*(University of Nova Gorica, Nova Gorica, Slovenia [jurij.urbancic@ung.si](mailto:jurij.urbancic@ung.si))*

#### Measurement of blood oxygen content and heart rate using the MAX30100 sensor

Nykyrui R.I., Goyanyuk I.V.

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#### Plasmon-Polariton Photodetectors for Optical Smoke Detectors: Influence of Humidity on Resonance Properties

Mamykin S., Indutnyi I.Z., Myn'ko V.I., Romanyuk V.R., Mamontova I.B.,  
Redko R.A., Dusheyko M.G., Lyashchuk Yu.M., Savchuk Ye.M., Tochkovyi V.O.,  
Shtykalo O.V., Kuznetsova D.A.

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#### Reflection of macroporous silicon with through pores

Onyshchenko V.

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#### Solid electrolyte membranes based on intramolecular polycomplexes

Kunitskaya L., Zheltonozhskaya T.B., Nesin S.D., Klepko V.V.

*(Institute of Macromolecular Chemistry NAS of Ukraine, Kyiv, Ukraine; [larisa\\_kunitskaya@ukr.net](mailto:larisa_kunitskaya@ukr.net))*

**Theoretical modelling of photoluminescence from thermally coupled levels**

Datsenko O., Wang Z., Zhang F., Golovynskyi S., Wang P., Sun Z., Li B.,  
Wu H.

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Shenzhen University, Shenzhen, P.R. China)*

**Session 5**  
**Functional crystalline materials: growth, physical properties and applications**

**A method of reducing short-circuit currents for integrated microsystems**

Benko T., Kogut I.T., Holota V.I., Gryga V.M.

*(Vasyl Stefanyk Precarpathian National University, Ivano-Frankivsk, Ukraine; [taras.benko@pnu.edu.ua](mailto:taras.benko@pnu.edu.ua))*

**Atomic-ordering kinetics in layered Fe–Pt structures**

Tatarenko V.A., Radchenko T.M., Koval Yu.M.

*(G.V.Kurdyumov Institute for Metal Physics, N.A.S. of Ukraine, Kyiv, Ukraine; [tatar@imp.kiev.ua](mailto:tatar@imp.kiev.ua))*

**Calculation of dissipation power from short-circuit currents in integrated signal converters on CMOS transistors**

Ilytskyi R.V., Pavlyuk M.F.

*(Vasyl Stefanyk Precarpathian National University, Ivano-Frankivsk, Ukraine; [taras.benko@pnu.edu.ua](mailto:taras.benko@pnu.edu.ua))*

**Conductive properties of TiO<sub>2</sub>-Ag<sub>2</sub>O composite materials**

Mykytyn I., Myroniuk I.F., Mandzyuk V.I.

*(Vasyl Stefanyk Precarpathian National University, Ivano-Frankivsk, Ukraine; [ihor.mykytyn@pnu.edu.ua](mailto:ihor.mykytyn@pnu.edu.ua))*

**Determination of thermodynamic properties of manganese-bismuth tellurides using EMF method**

Orujlu E., Babanly M.B.

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**Dose dependences of phosphorescence and conduction current relaxation in ZnSe crystals**

Kozhushko B., Bondar M.V., Degoda V.Ya., Podust G.P., Savchuk V.R.

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**Effect of laser irradiation on the optical properties of thin near-surface layers of p-Ge<sub>1-x</sub>Si<sub>x</sub> solid solution in 2-25μm region**

Demchyha L.A., Mynaylo M.A., Pekur D.V., Vuichyk M.V., Gentsar P.O., Stronskyi O.V., Levytskyi S.M.

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**Electronic properties of the near-surface layer of n-GaAs single crystals (100)**

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**Electronic structure and optical properties of Ag<sub>8</sub>SnTe<sub>6</sub> crystal calculated by DFT**

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**Experimental observation of light holes in CdTe**

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**High-entropy alloys in the Cu<sub>8</sub>B<sup>IV</sup>S<sub>6</sub>+Ag<sub>8</sub>B<sup>IV</sup>Se<sub>6</sub>↔Cu<sub>8</sub>B<sup>IV</sup>Se<sub>6</sub>+Ag<sub>8</sub>B<sup>IV</sup>S<sub>6</sub> (B<sup>IV</sup>-Si, Ge) systems**

Poladova A.N., Babanly M.B., Namazov J.S., Yusibov Yu.A.

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**Influence of Ge doping on the optical properties of n-CdTe single crystals in the region of the fundamental optical transition E<sub>0</sub>**

Gentsar P., Mynaylo M. A., Pekur D.V., Demchyna L.A., Vuichyk M.V., Strilchuk O.M., Stronskyi O.V., Zayats N.S., Trishchuk L.I.

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**Kinetic parameters of nanostructure of amorphous metal alloys based on Aluminium**

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**Light sources based on CdTe/CdS/ZnS heterostructures**

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**Microstructure and temperature-frequency dispersion of conductivity of lithium-iron spinel synthesized by sol-gel autocombustion technology**

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**Nano-morphology, local structural and electrical features of dislocation etch pits on boron-doped HPHT-diamond**

Danylenko I., Lytvyn P.M., Nikolenko A.S., Strelchuk V.V., Malyuta S.V., Kovalenko T.V., Suprun O.M., Lysakovskiy V.V., Ivakhnenko S.O.

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**New solution for Cd(Mn)Te surface passivation**

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**Percolation effects in the Bi<sub>2</sub>Se<sub>3</sub> crystals at Se → Te substitution**

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**Quantum cutting effect in doped CsPbCl<sub>3</sub>:Yb Single Crystals**

Muzyka T., Chornodolskyy Ya.M., Malynych S.Z., Demkiv T.M., Gamernyk R.V.

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**Reinvestigation of the pseudo-binary system GeTe-Sb<sub>2</sub>Te<sub>3</sub>**

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### **Research of a new thermoelectric material $\text{TiCo}_{1-x}\text{Cr}_x\text{Sb}$**

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### **Structure and Phase Changes in Fe-Ti System under the Influence of Thermocycling**

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### **Temperature dependencies of Fermi level in CdSb crystals with deep energy levels**

Koval Yu., Zakharchuk D., Fedosov S., Yashchynskyy L., Panasyuk L., Shymchuk S.

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### **The induced blue phase of cholesteric-nematic mixtures under the action of acetone vapors**

Kachurak Y., Mykytyuk Z.M., Vistak M.V., Kohut I.T., Politansky R.L., Shymchyshyn O.Y., Diskovskiy I.S., Vashchenko R.V.

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### **Thermodynamic analysis of the equilibrium vapor phase composition of the Cd-I<sub>2</sub> system**

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### **Thermodynamic properties of the $\text{FeIn}_2\text{X}_4$ (X-S, Se) compounds**

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### **XRD and ND study and structural changes in Ge-S-Ag glasses**

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**Session 6**  
**Thin films technology for energy saving**

**Surface-barrier CdTe diodes for photovoltaics**

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**The influence shading effect on the change output power of photovoltaic modules**

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**Thermoelectric properties of thin film microgenerators based on lead telluride**

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**Using the thermoelectric properties of Sb and Bi doped lead telluride to convert solar thermal energy into electrical energy**

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**Session 7**  
**Nanomaterials for biomedical application**

**Development of optical immunosensors based on TiO<sub>2</sub> thin films**

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**Influence of shooting factors on electrical impedance spectra of biological tissues**

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**Interactions of human serum albumin with II-VI based semiconductor quantum dots probed by optical spectroscopy methods**

Stolyarchuk I., Kuzyk O.V., Dan'kiv O.O., Stolyarchuk A.I., Pryima Yu.A.,  
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**Nanoimaging in the diagnosis of malignant tumours**

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**Session 8**  
**Innovative methods for teaching**

**Demonstrating the magnetic properties of the matters for the high school students'**

Stolyarchuk, I.D., Kuzyk, O.V., Pan'kiv, L.I., Dan'kiv O.O., Holskiy, V.B.  
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**Information and communication technologies in teaching physical and colloidal chemistry at the Faculty of Pharmacy**

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**Innovative technologies as a means of intensifying the educational process**

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**Innovative technologies for enhanced physical and mathematical learning in the Central Europe: contemporary issues and trends of fractal approach**

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**Methodical support of the course "Physical foundations of information technologies"**

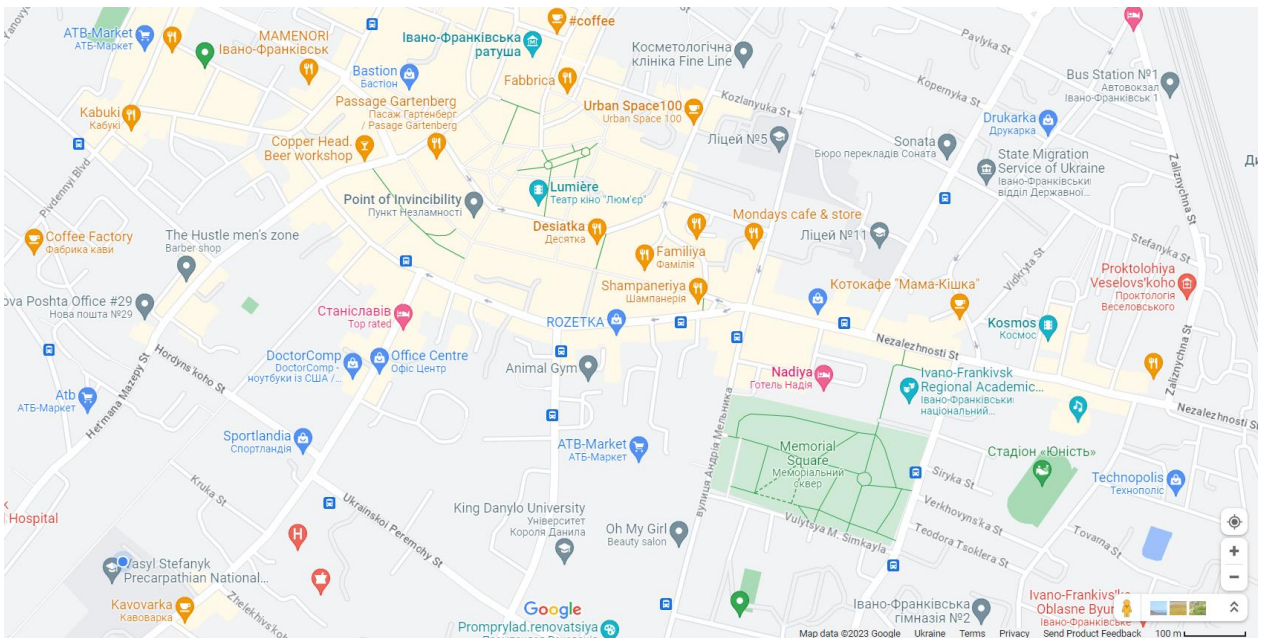
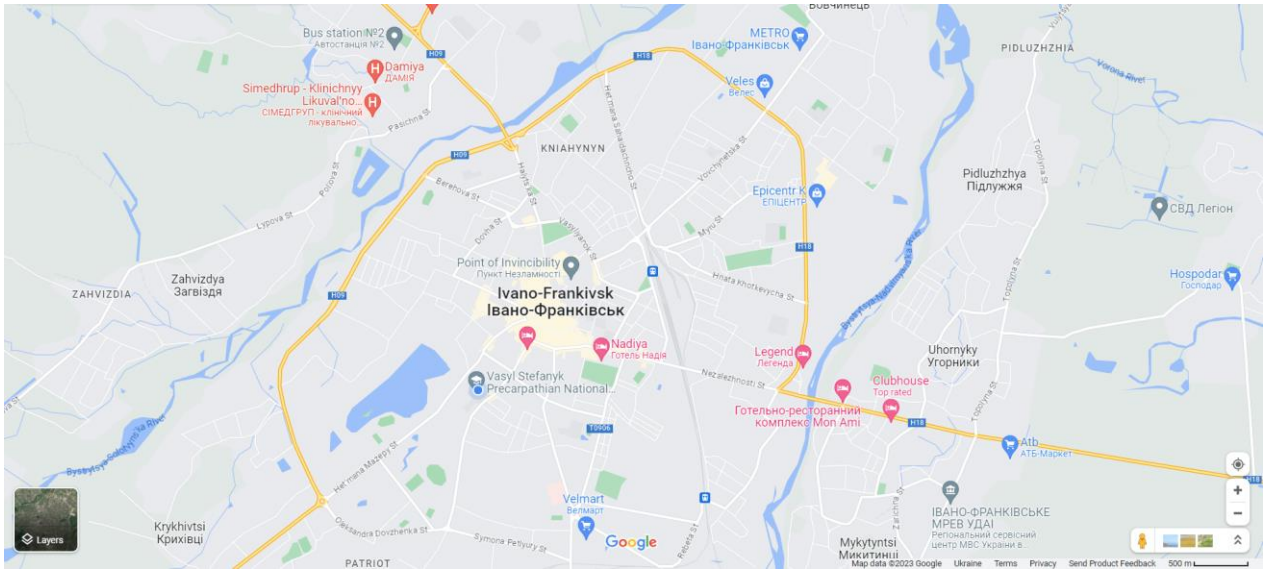
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**PMT-2 thermocouple vacuum gauge embedded measurement module development**

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**Research on the Effectiveness of Interdisciplinary Competence Formation in Integrated Physics and Geography Lessons**

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Наукове видання

**ФІЗИКА І ТЕХНОЛОГІЯ ТОНКИХ ПЛІВОК  
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