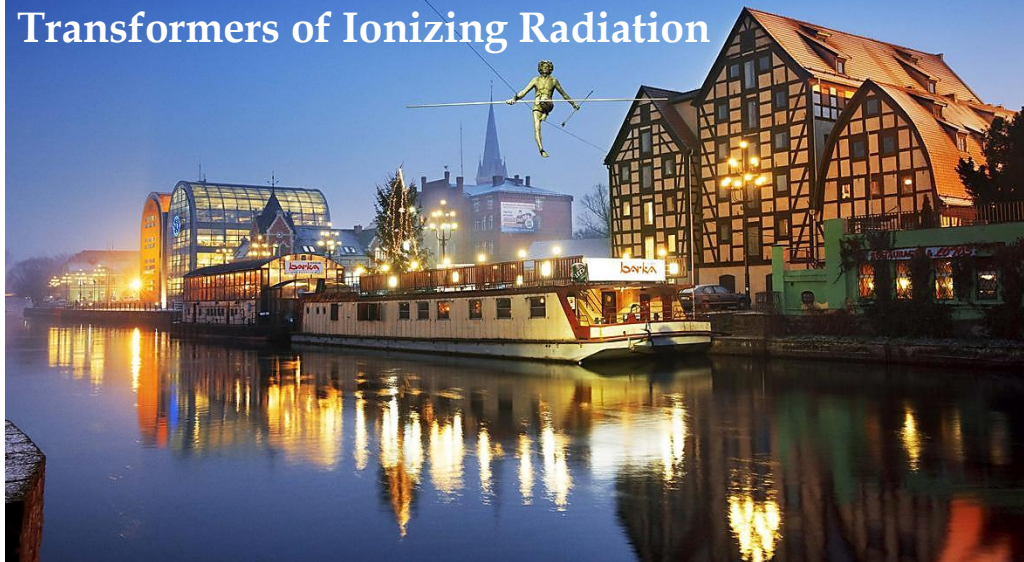


# 11<sup>th</sup> International Conference on Luminescent Detectors and Transformers of Ionizing Radiation



## LUMDETR 2021

12 - 17 September 2021  
BYDGOSZCZ  
POLAND

## PROGRAM

[http:// www.lumdetr2021.pl](http://www.lumdetr2021.pl)

✉ [office@lumdetr2021.pl](mailto:office@lumdetr2021.pl)

LUMDETR 2021 – FINAL PROGRAM

Monday, September 13		Tuesday, September 14		Wednesday, September 15		Thursday, September 16		Friday, September 17	
09:00–09:40	Welcome speeches Yu. Zorenko J. Woźny J. Kowalewski Marszałek (K.P. Wogiewodzko) President of Bylgoszcz In memoriam: R. Williams (M. Niki) M. Grinberg (S. Machlik) Keynote A. Gadoński K. Ślosarek	08:30–09:30	Keynote A. Yoshikawa O. Sielatskiy Oral K. Bartosiewicz E. Zabilina Y. Hizhnyi S. Kiselev	08:30–09:30	Keynote V. Laguta A. Lushchik Oral E. Radzhabov E. Zabelina Y. Hizhnyi S. Kiselev	08:30–09:20	Keynote M. Kirm W. Stręk Oral V. Pankratov D. Włodarczyk D. Spassky L.-I. Bul'uk J. Saaring	08:30–09:30	Keynote W. Gieszyk Y. Zhyvachevskyy Oral M. Sguel R. R. Ruiz-Torres K. Lemański A. Shyichuk
10:30–11:00	Coffee-break	10:30–11:00	Coffee-break	10:30–11:00	Coffee-break	10:35–11:00	Coffee-break	10:30–11:00	Coffee-break
11:00–12:00	Keynote M. Niki A. Vasil'ev Oral M. Yoshino L. Martinazzoli V. Vaniček S. Kurosawa	11:00–11:30	Keynote J. Pejchal Oral K. Kamada R. Král E. Galenin Y. Takizawa R. Yajima O. Lalinsky	11:00–12:00	Keynote M. Kitaura A. Popov Oral V. Nagirnyi V. Tsiurma T. Lesniewski N. Majewska	11:00–12:00	Keynote A. Mandowski E. Yukihiro Oral P. Bilski Ł. Kapłon M. Orfano R. Cala	11:00–12:00	Keynote M. Martini A. Chruścińska Oral M. Discher A. Mrozik H. Kim N. Minajluk-Gawel
13:00–14:00	Lunch	13:00–14:00	Lunch	13:00–14:00	Lunch	13:00–14:00	Lunch	13:00–14:00	Coffee-break
14:00–14:50	Keynote M. Brík A. Wojtowicz Oral S. Mann A. Monguzzi N. Galunov C. Fujiwara	14:00–14:50	Keynote M. Kucera T. Runka Oral Yu. Zorenko J.A. Maies A. Suchocki V. Gorbenko M. Buryl	14:00–22:00	Excursion with bonfire	14:00–15:00	Keynote M. Manyánski P. Olko Oral S. Ishizawa K. Fabišák O. V. Pakari J.B. Christensen	14:00–14:50	Keynote M. Batentschuk S. Schweizer Oral A. Markovskiy T. H. Q. Vu D. Stefanika
14:50–16:05	Oral W. Drozdowski S. Mann A. Monguzzi N. Galunov C. Fujiwara	14:50–16:05	Oral Yu. Zorenko J.A. Maies A. Suchocki V. Gorbenko M. Buryl	15:00–16:00	Oral S. Ishizawa K. Fabišák O. V. Pakari J.B. Christensen	15:00–16:00	Oral S. Ishizawa K. Fabišák O. V. Pakari J.B. Christensen	14:50–15:45	Oral A. Markovskiy T. H. Q. Vu D. Stefanika
16:05–16:30	Coffee-break	16:05–16:30	Coffee-break	16:05–16:30	Coffee-break	16:00–16:30	Coffee-break	15:45–16:00	Coffee-break
16:30–17:30	Keynote S. Tanabe S. Mahlik Oral M. Danilkin G. Tamulaitis S. Nargelas E. Trofimova	16:30–17:30	Keynote C. Dujiardin I. Villa Oral E. Minčková V. Jari M. Chylli R. Crapanzano	16:30–17:30	Keynote J. Winięcki T. Piotrowski Oral S. Witkiewicz-Lukaszek O. Rebane	16:00–16:30	Keynote J. Winięcki T. Piotrowski Oral S. Witkiewicz-Lukaszek O. Rebane	16:00–16:30	Conference closing
17:30–18:30	Oral M. Danilkin G. Tamulaitis S. Nargelas E. Trofimova	17:30–18:30	Oral E. Minčková V. Jari M. Chylli R. Crapanzano	17:30–18:00	Oral S. Witkiewicz-Lukaszek O. Rebane	17:30–18:00	Oral S. Witkiewicz-Lukaszek O. Rebane	16:00–16:30	Conference closing
18:30–21:00	Welcome party with refreshment	18:30–19:30	Poster session I with refreshment	18:00–19:00	Poster session II with refreshment	18:00–19:00	Poster session II with refreshment	16:00–16:30	Conference closing
				20:00–22:30	Concert and conference banquet	20:00–22:30	Concert and conference banquet		

# PREFACE

The Institute of Physics of the Kazimierz Wielki University and Oncology Center – prof. Łukaszczyk Memorial Hospital, both in Bydgoszcz, Poland, cordially invite you to participate in the 11<sup>th</sup> European Conference on Luminescent Detectors and Transformers of Ionizing Radiation, which will be held in Bydgoszcz, September 12-17, 2021.

LUMDETR 2021 will continue the traditions established by the previous meetings in Latvia (Riga, 1991), Estonia (Tallin, 1994), Poland (Ustroń, 1997), Latvia (Riga, 2000), Czech Republic (Prague, 2003), Ukraine (Lviv, 2006), Poland (Krakow, 2009), Germany (Halle, 2012), Estonia (Tartu, 2015) and Czech Republic (Prague, 2018).

This conference is an interdisciplinary forum for presentation of the latest developments in basic and applied research in the fields of radioluminescence, the energy transfer and storage in solids, the physics and chemistry of luminescent phosphor and scintillation materials, and related with them applications.

Invited keynote lectures will be given by leading scientists to introduce the main topics of the conference. Both oral and poster presentations will create the body of the conference program. Delivered manuscripts, after review process, will be published in the journal *Optical Materials X* (Elsevier Publ. House). Participants of the conference are cordially invited also to contribute original research papers or reviews to the special issues “Crystals, Films and Nanocomposite Scintillators (volume II)” in the journal *Crystals* (MDPI) and „Materials for Luminescent Detectors and Transformers of Ionizing Radiation” in in the journal *Materials* (MDPI).

LUMDETR 2021 will be held under the patronage of Mr Piotr Całbecki - the Marshal of the Kuyavian-Pomeranian Voivodeship and Mr Rafał Bruski - the President of Bydgoszcz as well as is supported and sponsored by Polish Physical Society and Polish Society of Medical Physics. Conference media partners and sponsors of the award for the best oral and poster presentations are *Crystals* and *Materials*, an open access journals by MDPI.



# COMMITTEES

## Conference Chairpersons

Chair - Prof. Dr. Yuriy Zorenko

Vice-Chair - Dr. Janusz Winiecki

Vice-Chair - Prof. Dr. Andrzej Suchocki

Vice-Chair - Prof. Dr. Kazimierz Fabisiak

Conference secretary - Dr. Karol Bartosiewicz

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J. Kowalewski, Director of Oncology Center - prof Franciszek Łukaszczyk Memorial Hospital

M. Adamski, Rector of Bydgoszcz University of Technology

A. Gadomski, Chair of Bydgoszcz branch of Polish Physical Society (PPS)

K. Ślosarek, Chair of Polish Society of Medical Physics (FSMP)

R. Bruski, The President of Bydgoszcz

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A. Wojtowicz (Poland)

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T. Piotrowski (Poland)

J. Winiecki (Poland)

## Local Organizing Committee

### Institute of Physics UKW and PPS (Bydgoszcz branch)

Yu. Zorenko - conference Chair

A. Suchocki - conference vice Chair

K. Fabisiak - conference vice Chair

K. Bartosiewicz - conference secretary

G. Czerniak - PPS, Bydgoszcz branch

S. Witkiewicz-Łukaszek V. Gorbenko

P. Popielarski T. Zorenko

A. Markovskiy Y. Syrotych

A. Shakhno A. Majewski-Napierkowski

### Oncology Center in Bydgoszcz

J. Winiecki - conference vice Chair, Head of Medical Physics Department, Oncology Center

K. Klawińska-Knach - vice-director of Oncology Center

E. Woźniak - Head of the Operation and Computerization Department, Oncology Center

A. Madaj - Head of the PARIS Center

P. Korowiecki

S. Nowakowski

# ACCESS

## PARIS, Center of Active Rehabilitation and Sport at Oncology Center in Bydgoszcz

Address: Romanowskiej Str. 2, 85-796 Bydgoszcz



From:

Main railway station (estimated time: 30 min)

- Take tram 5 (direction "Łoskoń"), stop at "Akademicka/Rejewskiego"

Main bus station (estimated time: 24 min)

- Take tram 5 (direction "Łoskoń"), stop at "Akademicka/Rejewskiego"
- Take tram 3 (direction "Łoskoń"), stop at "Akademicka/Rejewskiego"
- Take tram 10 (direction "Niepodległości"), stop at "Akademicka/Rejewskiego"

Airport (estimated time: 6 min)

- Take bus 80 (direction "Dworzec Główny"), stop at "Rondo Jagiellonów", after take tram 10,5,3

Taxi: +48 52 344 40 000 or +48 52 196 24

Radio Taxi: KOMFORT (52) 196-62 or +48 800-3-196-62

Bus/tram ticket price: 3 zł (0.7 EUR)

# GENERAL INFORMATION

## Conference desk:

Location – ground floor of the PARIS Center. See the map below.

## Conference language:

Conference language is English; no translation will be provided

## Internet

WIFI password is available at the reception desk

## Dress Code

The dress code for Welcome Dinner is smart casual.

## Information:

Any information available in the Conference desk

## Certificate of attendance

A certificate of attendance is available in the reception desk

## Poster, lunches and coffee break area

Lunches will be served in Foyer hall of PARIS center.

See the map below.

## Telephone

The international code for Poland is 48.





# GENERAL INFORMATION

## Emergency phone numbers

General emergency number 112, Ambulance 999, Fire Brigade 998, Police 997

### These numbers may also be useful:

Bydgoszcz public transportation information: (52) 324 94 30

International flight departure information: (22) 650 39 43

International flight arrival information: (22) 650 42 20

## Discover Bydgoszcz

Bydgoszcz is the capital of Kujawsko- Pomorskie Voivodeship and the eighth biggest city in Poland. It occupies part of the historical region of Kuyavia and is picturesquely located on the rivers Brda, Vistula, and the Bydgoszcz Canal. Visit the *Mysłęcinek* park (Forest Park of Culture and Recreation), which is situated north of the city, along Gdańska street. This is the largest park in the city, and one of the largest in Poland (8 km<sup>2</sup>, 2,5 times bigger than New York's Central Park). In the City Centre there is *Wyspa Młyńska* (Mill Island) which is among the most spectacular and atmospheric places in Bydgoszcz. What makes it unique is the location in the heart of the city center, few steps from the Old Market Square.

## Polish Food

If you want to try traditional Polish cuisine, stop counting your calories. Typical meals are very hearty and often contain a lot of meat. Just sampling them is enough to discover that they are really delicious. The most recommendable dishes are: *bigos*, *kotlet schabowy*, *pierogi* and *gotąbki*. Poles boast that their two basic products are bread and sausages.

## Tourism Office

Bydgoszcz Information Centre

2 Batorego Street / 1 Niedźwiedzia Street; 85-104 Bydgoszcz

phone: +48 52 340 45 50

Opening hours: Monday-Friday: 9.00-18.00; Saturday - Sunday: 10.00-16.00

email: [info@visitbydgoszcz.pl](mailto:info@visitbydgoszcz.pl)

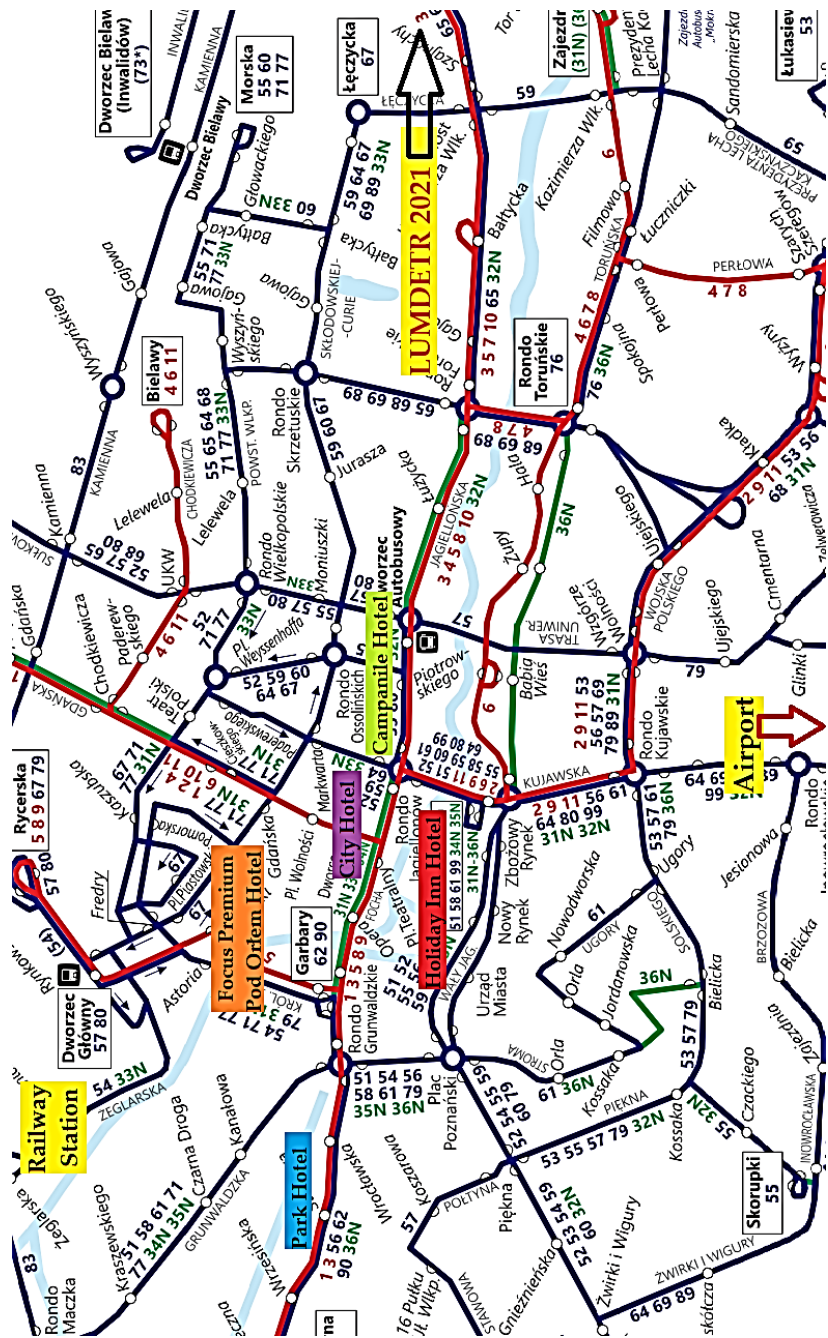
## Contacts

[office@lumdetr2021.pl](mailto:office@lumdetr2021.pl)

Powstanców Wielkopolskich str, 2, 85-090 Bydgoszcz, Poland

Phone + 48 52 322 52 76 Fax + 48 52 322 52 76

# PUBLIC TRANSPORT MAP





# SOCIAL PROGRAM

- ▶ 13 Sep 2021: Welcome party – PARIS center – hall



- ▶ 14 Sep 2021: Bydgoszcz city walking/ bus tour, including visit to DAG Bromberg (Exploseum) museum



- ▶ 15 Sep 2021: Conference excursion to Toruń and Golub-Dobrzyń castle with bonfire and refreshments



- ▶ 16 Sep 2021: Concerts and Conference Gala-dinner in Lubstroń Palace



Golub-Dobrzyń Castle is a four-wing conventional Teutonic fortress built at the turn of the fourteenth century, built on a hill as a look-out point over the whole town of Golub-Dobrzyń. The castle was initially constructed in a brick Gothic architectural style and a Renaissance attic was added in the 17<sup>th</sup> century.

Lubostroń palace in its shape refers to Palladio's Villa Rotonda from Vicenza, Merlini's Rabbit House from Warsaw and Villa Trissino from Meledo. The palace is surrounded by a landscape park of several dozen hectares (c. 40 ha), flowing smoothly into the forest. The park was designed by the renowned landscape architect Teichert.

# SCIENTIFIC PROGRAM

## Sunday, 12.09.2021

15:00–18:00 **Arrival and registration with refreshment**  
PARIS Center hall – conference level

## Monday, 13.09.2021

08.00- 09.00 **Registration of the participants**

09:00–09.40 **OPENING ceremony**

**Yu. Zorenko**, conference Chairman, *welcome speech*

**J. Woźny**, Rector UKW, *welcome speech*

**J. Kowalewski**, Director of Oncology Centers in Bydgoszcz, *welcome speech*

**Person**, represented the Marshal of Kujawsko-Pomorske Wojewodship Office, *welcome speech*

**Person**, represented the President of Bydgoszcz, *welcome speech*

09.40-10.00 **In memoriam: R. Williams (M. Nikl) and M. Grinberg (S. Mahlik)**

10.00–10:15 MoS0-K1 **A. Gadomski** *Bydgoszcz Chapter of the Polish Physical Society: Past and Present*

10:15–10:30 MoS0-K2 **K. Śłosarek** *Polish Society of Medical Physics - professional and scientific activity*

10:30–11:00 **Coffee-break**

11:00–13:00 **S1 Radioluminescence and scintillation mechanisms - 1**

**Chairman: Christophe Dujardin**

11:00–11:30 MoS1-K3 **M. Nikl** *Composition engineering in multicomponent garnets: new demands*

11:30–12:00 MoS1-K4 **A. Vasil'ev** *Scintillation properties in connection with material structure and track fluctuations (remote presentation)*

12:00–12:15 MoS1-O1 **M. Yoshino** *Scintillation properties and particle identification capability of (Li,Ca)<sub>2</sub> solid solution (remote presentation)*

12:15–12:30 MoS1-O2 **L. Martinazzoli** *Scintillation properties and timing performance of state-of-the-art Gd<sub>3</sub>Al<sub>2</sub>Ga<sub>3</sub>O<sub>12</sub> single crystals*

12:30–12:45 MoS1-O3 **V. Vaněček** *Novel cross-luminescence scintillators: an exploration of CsMCl<sub>3</sub> perovskite matrix*

12:45–13:00 MoS1-O4 **S. Kurosawa** *Fast neutron imaging using carbazole and p-terphenyl scintillator (remote presentation)*

13:00–14:00 **Lunch**

14:00–16:05 **S2 Radioluminescence and scintillation mechanisms - 2**

**Chairman: Mauro Fassoli**

14:00–14:25 MoS2-K5 **M. Brik** *First-principles calculations of electronic properties of scintillating materials*

14:25–14:50 MoS2-K6 **A. Wojtowicz** *Radiative and nonradiative recombination in β-Ga<sub>2</sub>O<sub>3</sub> scintillator crystals*

14:50–15:05 MoS2-O5 **W. Drozdowski** *Heading for brighter and faster β-Ga<sub>2</sub>O<sub>3</sub> scintillator crystals*

15:05–15:20 MoS2-O6 **S. Mann** *Timing properties of radioluminescence in nanoparticle ZnS:Ag scintillators (remote presentation)*

# SCIENTIFIC PROGRAM

15:20–15:35	MoS2-O7	A. Monguzzi	<i>Sensitization of scintillation in multicomponent polymeric composites</i>
15:35–15:50	MoS2-O8	N. Galunov	<i>Organic heterostructured scintillators with a high pulse shape discrimination capability (remote presentation)</i>
15:50–16:05	MoS2-O9	C. Fujiwara	<i>Scintillation properties for Cs<sub>2</sub>Hf(I,Br)<sub>6</sub> with red emission for real-time high dose rate monitor (remote presentation)</i>

## 16:05–16:30 Coffee-break

## 16:30–18:30 S3 Energy transfer and storage in the luminescent detectors

Chairman: Andrzej Suchocki

16:30–17:00	MoS3-K7	<b>S. Tanabe</b>	<b><i>Energy transfer and NIR luminescence in lanthanoid and transition metal codoped storage phosphors (remote presentation)</i></b>
17:00–17:30	MoS3-K8	<b>S. Mahlik</b>	<b><i>Broadband near-Infrared phosphors for light emitting diodes</i></b>
17:30–17:45	MoS3-10	M. Danilkin	<i>Accelerated radiative transitions in impurities due to energy transfer from impurity-bound excitons (remote presentation)</i>
17:45–18:00	MoS3-O11	G. Tamulaitis	<i>Excitation relaxation via intra- and intercenter transitions of Pr<sup>3+</sup> ion in garnet-type scintillator</i>
18:00–18:15	MoS3-O12	S. Nargelas	<i>Relaxation of electronic excitation at cerium ions in GAGG matrix studied using transient absorption technique</i>
18:15–18:30	MoS3-O13	E. Trofimova	<i>Luminescence properties and energy transfer processes in LiSrPO<sub>4</sub>:Pr<sup>3+</sup>,Na<sup>+</sup>,Mg<sup>2+</sup> (remote presentation)</i>

## 18:30–21:00 Welcome party

## Tuesday, 14.09.2021

## 8:30–10:30 S4 Technology and methods of luminescent material preparation: Crystal growth 1

Chairman: Martin Nikl

08:30–09:00	TuS4-K9	<b>A. Yoshikawa</b>	<b><i>A rapid screening method for novel scintillator crystals</i></b>
09:00–09:30	TuS4-K10	<b>O. Sidletskiy</b>	<b><i>Advances in technologies of bulk crystal growth from non-precious metal crucibles</i></b>
09:30–09:45	TuS4-O14	K. Bartosiewicz	<i>La codoping strategy for modifying atoms segregation and luminescence and scintillation properties of LuAG:Pr single crystals</i>
09:45–10:00	TuS4-O15	F. Zajíc	<i>Single crystal growth of garnets by floating zone method in laser furnace</i>
10:00–10:15	TuS4-O16	Ia. Gerasymov	<i>Effects of co-doping on optical and scintillation properties of YAG:Ce,C crystals</i>
10:15–10:30	TuS4-O17	D. Kofanov	<i>Growth and characterization of mixed LuYAG:Ce crystals under reducing atmosphere (remote presentation)</i>

## 10:30–11:00 Coffee-break

## 11:00–13:00 S5 Technology and methods of luminescent material preparation: Crystal growth 2

Chairman: Miroslav Kucera

# SCIENTIFIC PROGRAM

11:00–11:30	TuS5-K11	<b>J. Pejchal</b>	<b><i>Luminescence mechanism and Ce incorporation in LaAP:Ce single crystals</i></b>
11:30–11:45	TuS5-O18	K. Kamada	<i>Growth and scintillation properties of rare-earth doped SrO and CaO by core heating method (remote presentation)</i>
11:45–12:00	TuS5-O19	R. Král	<i>Cs<sub>2</sub>Hf<sub>x</sub>Zr<sub>1-x</sub>Cl<sub>6</sub> mixed crystals, their growth by vertical Bridgman method and characterization of luminescent and scintillation properties</i>
12:00–12:15	TuS5-O20	E. Galenin	<i>Crystallization of Y<sub>2</sub>O<sub>3</sub> melt in tungsten crucibles (remote presentation)</i>
12:15–12:30	TuS5-O21	Y. Takizawa	<i>Growth and scintillation properties of CsI/CsCl/KCl eutectics for radiation imaging applications (remote presentation)</i>
12:30–12:45	TuS5-O22	R. Yajima	<i>Melt growth of Zn<sub>3</sub>Ta<sub>2</sub>O<sub>8</sub> crystal by core heating method and its scintillation properties (remote presentation)</i>
12:45–13:00	TuS5-O23	O. Lalinsky	<i>Optimization of cathodoluminescence efficiency of scintillators for low-energy electron detectors</i>

**13:00–14:00 Lunch**

**14:00–16:05 S6 Technology and methods of luminescent material preparation: Film preparation**

**Chairman: Yuriy Zorenko**

14:00–14:25	TuS6-K12	<b>M. Kucera</b>	<b><i>Growth and properties of multicomponent garnet and perovskite films for low afterglow scintillators</i></b>
14:25–14:50	TuS6-K13	<b>T. Runka</b>	<b><i>Raman spectroscopy of single crystalline films of perovskites</i></b>
14:50–15:05	TuS6-O24	Yu. Zorenko	<i>Growth and luminescent properties of Bi<sup>3+</sup>, Tb<sup>3+</sup> and Eu<sup>3+</sup> doped Lu<sub>2</sub>O<sub>3</sub> single crystalline films and composites on their base</i>
15:05–15:20	TuS6-O25	J.A. Mares	<i>Investigation of scintillating properties of single crystalline films and composite scintillators based on simple and mixed garnets</i>
15:20–15:35	TuS6-O26	A. Suchocki	<i>High pressure studies of Ce<sup>3+</sup> luminescence in epitaxial LuAlO<sub>3</sub> single crystalline film</i>
15:35–15:50	TuS6-O27	V. Gorbenko	<i>Development of composite scintillators based on the Ce<sup>3+</sup> doped single crystalline films and single crystals of orthosilicate compounds.</i>
15:50–16:05	TuS6-O28	M. Buryi	<i>Optical and magnetic properties of epitaxially grown GaN:Ge(Si) thin films</i>

**16:05–16:30 Coffeee-break**

**16:30–18:30 S7 Technology and methods of luminescent material preparation: Detectors based on the nanophosphors and nanocomposites**

**Chairman: Marco Kirm**

16:30–17:00	TuS7-K14	<b>C. Dujardin</b>	<b><i>Scintillation mechanisms of II-VI nano-semiconductor heterostructure</i></b>
17:00–17:30	TuS7-K15	<b>I. Villa</b>	<b><i>Scintillation properties of advanced nanocomposite materials</i></b>
17:30–17:45	TuS7-O29	E. Mihóková	<i>The role of Cs<sub>4</sub>PbBr<sub>6</sub> phase in the luminescence performance of bright CsPbBr<sub>3</sub> nanocrystals</i>

# SCIENTIFIC PROGRAM

17:45–18:00	TuS7-O30	V. Jarý	<i>Modification of optical properties of the GaN nanostructures via annealing in various atmospheres</i>
18:00–18:15	TuS7-O31	M. Chylli	<i>The influence of precursor ratio in the Cd-Zn-S quantum dots synthesis on their morphological and optical properties</i>
18:15–18:30	TuS7-O32	R. Crapanzano	<i>Radio- and photo-luminescence of ZnO nanoparticles with different morphologies and functionalization.</i>

## 18:30–19:30 Poster session I with refreshment

### Wednesday, 15.09.2021

#### 8:30–10:30 S8 Defects and their role in performance of luminescence material - 1 Chairman: Anna Vedda

08:30–09:00	WeS8-K16	V. Laguta	<i>Electron and hole trapping in wide band-gap oxide scintillation crystals</i>
09:00–09:30	WeS8-K17	A. Lushchik	<i>Detection of uncatchable oxygen interstitials in neutron-irradiated corundum crystals (remote presentation)</i>
09:30–09:45	WeS8-O34	E. Radzhabov	<i>Fine structure of 4f-5d absorption spectra of MeF<sub>2</sub>-Yb<sup>3+</sup> in the vacuum ultraviolet region under synchrotron excitation (remote presentation)</i>
09:45–10:00	WeS8-O35	E. Zabelina	<i>Gadolinium-aluminum-gallium garnet single crystals with partial substitution of gallium with aluminum and their optical characterization (remote presentation)</i>
10:00–10:15	WeS8-O36	Y. Hizhnyi	<i>Band gap engineering of RAlO<sub>3</sub> (R = Y, La, Gd, Yb, Lu) perovskites</i>
10:15–10:30	WeS8-O37	S. Kiselev	<i>Influence of irradiation with fast electron beam on energy transport in praseodymium-ion doped phosphates (remote presentation)</i>

#### 10:30–11:00 Coffee-break

#### 11:00–13:30 S9 Defects and their role in performance of luminescence material - 2 Chairman: Valentyn Laguta

11:00–11:30	WeS9-K18	M. Kitaura	<i>Gamma-ray-induced Positron Annihilation Lifetime Spectroscopy for Characterization of Imperfections in Scintillator Crystals (remote presentation)</i>
11:30–12:00	WeS9-K19	A. Popov	<i>Detailed analysis of self-trapped hole V<sub>k</sub> center mobility in binary and complex halides as a function of lattice parameters</i>
12:00–12:15	WeS9-O38	V. Nagirnyi	<i>Inter-configurational 4f5d → f radiative transitions of Pr<sup>3+</sup> ions doped in Li<sub>6</sub>Y(BO<sub>3</sub>)<sub>3</sub> single crystals</i>
12:15–12:30	WeS9-O39	V. Tsiumra	<i>Spectroscopic studies of Bi<sup>3+</sup> - doped Ca<sub>3</sub>Ga<sub>2</sub>Ge<sub>3</sub>O<sub>12</sub> garnet</i>
12:30–12:45	WeS9-O40	T. Leśniewski	<i>Pressure induced changes in the optical properties of Mn<sup>4+</sup> doped fluoride phosphors</i>
12:45–13:00	WeS9-O41	N. Majewska	<i>The broadband IR emission from Cr<sup>3+</sup> ions in magnetoplumbite</i>

#### 13.00–14.00 Lunch

#### 14.00–22.00 Excursion with bonfire



# SCIENTIFIC PROGRAM

**Thursday, 16.09.2021**

**08:30–10:35 S10 Luminescent spectroscopy of materials for detectors of ionization radiation: conventional methods and synchrotron radiation**

**Chairman: Vitaliy Nagirnyi**

08:30–08:55	ThS10-K20	<b>M. Kirm</b>	<i>Time-resolved luminescence spectroscopy in studies of ultrafast processes in wide gap materials using advanced light sources</i>
08:55–09:20	ThS10-K21	<b>W. Stręk</b>	<i>Emission properties of rare earth doped materials under high power excitation</i>
09:20–09:35	ThS10-O42	V. Pankratov	<i>Time-resolved luminescence and VUV excitation spectroscopy of GGAG:Ce single crystals</i>
09:35–09:50	ThS10-O43	D. Włodarczyk	<i>Structural and optical studies of novel, cerium-tungstate double perovskites doped with rare-earth ions</i>
09:50–10:05	ThS10-O44	D. Spassky	<i>Luminescence properties of GAGG:Ce scintillator under intense laser irradiation (remote presentation)</i>
10:05–10:20	ThS10-O45	L.-I. Bulyk	<i>Pressure induced blue luminescence in CsPbBr<sub>3</sub> single crystals</i>
10:20–10:35	ThS10-O46	J. Saaring	<i>Relaxation of anion and cation electronic excitations in hexafluorogermanates</i>

**10:35–11:00 Coffee-break**

**11:00–13:00 S11 Optically and thermally stimulated luminescence in solids - 1**

**Chairman: Paweł Olko**

11:00–11:30	ThS11-K22	<b>A. Mandowski</b>	<i>Theory and a novel approach to optically stimulated luminescence in complex systems</i>
11:30–12:00	ThS11-K23	<b>E. Yukihiro</b>	<i>The still unexplained mechanism of the UV emission of Al<sub>2</sub>O<sub>3</sub>:C: what do we know and how do we move forward?</i>
12:00–12:15	ThS11-O47	P. Bilski	<i>Infrared-stimulated luminescence of garnets</i>
12:15–12:30	ThS11-O48	Ł. Kapłon	<i>Green-emitting polystyrene scintillators for plastic scintillation dosimetry</i>
12:30–12:45	ThS11-O49	M. Orfano	<i>Photoluminescence and radioluminescence properties of hafnium oxide-based Metal Organic Framework (MOF) nanocrystals and composites.</i>
12:45–13:00	ThS11-O50	R. Cala	<i>Characterization of BSO and mixed BGSO crystals for future dual-readout calorimetry</i>

**13:00–14:00 Lunch**

**14:00–16:00 S12 Application of scintillators and detectors for medical diagnostics and biological research - 1**

**Chairman: Janusz Winiecki**

14:00–14:30	ThS12-K24	<b>M. Maryański</b>	<i>Mechanisms of radiochromic response in polymer gel dosimeters</i>
14:30–15:00	ThS12-K25	<b>P. Olko</b>	<i>Luminescence dosimetry in proton therapy</i>
15:00–15:15	ThS12-O51	S. Ishizawa	<i>Development of red-emitting oxide scintillator for decommissioning Fukushima Daiichi nuclear power plant (remote presentation)</i>

# SCIENTIFIC PROGRAM

15:15–15:30	ThS12-O52	K. Fabisiak	<i>UV detector based on polycrystalline CVD diamonds</i>
15:30–15:45	ThS12-O53	O. V. Pakari	<i>Investigation of the UV emission mechanism in Al<sub>2</sub>O<sub>3</sub>:C using pulsed OSL and photo-transfer experiments</i>
15:45–16:00	ThS12-O54	J.B. Christensen	<i>Improving linear energy transfer measurements using automated OSL readers</i>

## 16:00–16:30 Coffee-break

### 16:30–18:00 S13 Application of scintillators and detectors for medical diagnostics and biological research – 2 Chairman: Marek Maryński

16:30–17:00	ThS13-K26	J. Winięcki	<i>The purposes, principles and common techniques used in radiation therapy</i>
17:00–17:30	ThS13-K27	T. Piotrowski	<i>What is plan quality in radiotherapy?</i>
17:30–17:45	ThS13-O55	S. Witkiewicz-Łukaszek	<i>Basic characteristics of dose distributions of photons beam for radiotherapeutic applications using YAG:Ce crystal detectors</i>
17:45–18:00	ThS13-O56	O. Rebane	<i>Time-resolved fluorescence study of bacterial spores treated by hydrogen peroxide vapour for monitoring decontamination process (remote presentation)</i>

## 18:00–19:00 Poster session II with refreshment

## 20:00–22:30 Concert and conference banquet

## Friday, 17.09.2021

### 08:30–10:30 S14 Optically and thermally stimulated luminescence in solids – 2 Chairman: Arkadiusz Mandowski

08:30–09:00	FrS14-K28	W. Gieszczyk	<i>LiMgPO<sub>4</sub>:RE - review of the results of 7-years investigations on new dosimetric crystals</i>
09:00–09:30	FrS14-K29	Y. Zhdachevskyy	<i>Trapping and recombination mechanisms in YAP:Mn<sup>2+</sup> crystals as promising TL/OSL detectors</i>
09:30–09:45	FrS14-O57	M. Sądel	<i>2D OSL dosimetry based on LiMgPO<sub>4</sub> powder embedded into the flat sheet silicone foils</i>
09:45–10:00	FrS14-O58	R.R. Ruiz-Torres	<i>Thermoluminescence of beta irradiated CaAl<sub>2</sub>O<sub>4</sub>:Eu<sup>2+</sup>,Dy<sup>3+</sup> synthesized by combustion method: thermal quenching and thermal cleaning studies</i>
10:00–10:15	FrS14-O59	K. Lemański	<i>Luminescent properties of Ba<sub>2</sub>MgWO<sub>6</sub> polycrystals and ceramics doped with the Eu<sup>3+</sup> ions</i>
10:15–10:30	FrS14-O60	A. Shyichuk	<i>Electron traps in Lu<sub>2</sub>O<sub>3</sub>:Hf from density functional calculations</i>

## 10:30–11:00 Coffee-break

### 11:00–13:00 S15 Radiation dosimetry Chairman: Paweł Bilski

11:00–11:30	FrS15-K30	M. Martini	<i>Natural radiation dosimetry applications: dating ancient bronze statue by luminescence</i>
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# SCIENTIFIC PROGRAM

11:30–12:00	FrS15-K31	<b>A. Chruścińska</b>	<i>New challenges and problems in the field of luminescence dating</i>
12:00–12:15	FrS15-O61	M. Discher	<i>Temperature assisted OSL measurements of display glass from mobile phones for retrospective dosimetry</i>
12:15–12:30	FrS15-O62	A. Mrozik	<i>Common medicines as emergency dosimeters</i>
12:30–12:45	FrS15-O63	H. Kim	<i>Dose recovery test using a TA-OSL protocol of display glass for accident dosimetry (remote presentation)</i>
12:45–13:00	FrS15-O64	N. Miniajluk-Gaweł	<i>Influence of sintering parameters on spectroscopic properties of <math>\text{BMW:Eu}^{3+}</math> ceramic materials (remote presentation)</i>
<b>13:00–14:00</b>	<b>Lunch</b>		
<b>14:00–15:45</b>	<b>S16 Other phosphor applications</b>		
		<b>Chairman: Andrzej Wojtowicz</b>	
14:00–14:30	FrS16-K32	<b>M. Batentschuk</b>	<i>New phosphors for high temperature thermometry</i>
14:30–15:00	FrS16-K33	<b>S. Schweizer</b>	<i>Light guides based on lanthanide-doped borate glass (remote presentation)</i>
15:00–15:15	FrS16-O65	A. Markovskiy	<i>Composite color converters based on <math>\text{Tb}_{1.5}\text{Gd}_{1.5}\text{Al}_5\text{O}_{12}:\text{Ce}</math> single crystalline films and <math>\text{Y}_3\text{Al}_5\text{O}_{12}:\text{Ce}</math> crystal substrates</i>
15:15–15:30	FrS16-O66	T. H. Q. Vu	<i><math>\text{Ba}_2\text{MgWO}_6:\text{Er}^{3+}</math> as a novel bifunctional double perovskites for white-light emitting phosphor and low-temperature optical thermometer</i>
15:30–15:45	FrS16-O67	D. Stefańska	<i>Luminescence and thermal behavior of <math>\text{La}_2\text{MgTiO}_6</math>-<math>\text{Ba}_2\text{MgWO}_6</math> solid solution (remote presentation)</i>
<b>15:45–16:00</b>	<b>Coffee-break</b>		
<b>16:00–16:30</b>	<b>Conference closing</b>		

## POSTER SESION I

**Tuesday, 14.09.2021, 18:30-19:30**

**PARIS Center, posters hall**

**Chairmen's: Miroslaw Batentschuk; Winicjusz Drozdowski**

TuP1-1	V.A. Pustovarov	<i>Site-selective luminescence of solid solutions based on silicate-tungstates doped with <math>\text{Eu}^{3+}</math> ions (remote presentation)</i>
TuP1-2	E.V. Tishchenko	<i>Scattering of hot charge carriers in solid solutions of dielectric crystals with substitutional disorder (remote presentation)</i>
TuP1-3	A. Bachiri	<i>Scintillation yield of Czochralski-grown <math>\beta\text{-Ga}_2\text{O}_3</math> and <math>\beta\text{-Ga}_2\text{O}_3:\text{Si}</math> crystals</i>
TuP1-4	A. Romet	<i>Developing UV emitters based on undoped <math>\text{ZnAl}_2\text{O}_4</math> nanofibers</i>
TuP1-5	V. Pankratov	<i>Time-resolved luminescence spectroscopy of rare-earth doped <math>\text{SrMoO}_4</math> single crystals</i>
TuP1-6	M. Yoshino	<i>Crystal growth, scintillation property, and pulse shape discrimination of <math>\text{Ca}(\text{Br},\text{I})_2</math> scintillators (remote presentation)</i>

# POSTER SESION I

- TuP1-7 C. Dujardin *Purification, growth and optical properties of large  ${}^6\text{Li}_2\text{MoO}_4$  for scintillating bolometer*
- TuP1-8 K. Kamada *Fabrication of  ${}^6\text{LiBr}$  and  $\text{BaBr}_2$  based eutectic scintillator and its radiation response (remote presentation)*
- TuP1-9 Y. Takizawa *Growth and scintillation properties of  $\text{Ce:LaBr}_3/\text{LiBr}$  eutectics (remote presentation)*
- TuP1-10 Y. Syrotych *New types of composite scintillators based on the single crystalline films and crystals of  $\text{Gd}_3\text{Al}_{5-x}\text{Ga}_x\text{O}_{12}:\text{Ce}$  garnets*
- TuP1-11 P. Popielarski *Luminescent properties of  $\text{YAG:Ce}$  and  $\text{TbAG:Ce}$  nanopowder thin films in polycarbonate (PC) and polystyrene (PS) matrices*
- TuP1-12 A. Mrozik *Analysis of TL signals from SCF/SC composite detectors ( $\text{LuAG:Ce/YAG}$ ) for distinguishing radiation field components*
- TuP1-13 Yu. Zorenko  *$\text{Ce}^{3+}$  to  $\text{Ce}^{4+}$  recharge in Ce doped  $\text{Y}_{3-x}\text{Ca}_x\text{Al}_{5-x}\text{Si}_x\text{O}_{12}$  and  $\text{Y}_3\text{Al}_{5-2y}\text{Mg}_y\text{Si}_y\text{O}_{12}$  single crystalline films: EPR and optical studies*
- TuP1-14 S. Witkiewicz-Lukaszek *Three-layered composite scintillator based on the YAG and LuAG garnets for simultaneous registration of  $\alpha$ -,  $\beta$ -particles and  $\gamma$ -quanta*
- TuP1-15 M. Makowski *Scintillation time profiles of Czochralski-grown  $\beta\text{-Ga}_2\text{O}_3$  and  $\beta\text{-Ga}_2\text{O}_3:\text{Si}$  crystals*
- TuP1-16 W. Dewo *Raman and luminescent spectroscopy of  $\text{TbAG:Mn}$  garnet single crystalline film phosphor*
- TuP1-17 A. Voloshinovskii *Polymer nanocomposites with embedded  $\text{CsPbBr}_3$  nanoparticles (remote presentation)*
- TuP1-18 V. Vistovsky *Temperature behavior of the near band edge luminescence in  $\text{CsPbBr}_3$  single crystals, microcrystals and nanoparticles (remote presentation)*
- TuP1-19 A. Akhmetova *Synthesis and characterization 2D  $\text{CdTe}$  nanoplatelets for PV application (remote presentation)*
- TuP1-20 A. Shakhno *Micro-powder phosphors based on the  $\text{Ce}^{3+}$  and  $\text{Mn}^{2+}$  doped  $\text{Ca}_2\text{YMgScSi}_3\text{O}_{12}$  silicate garnet for WLED application*
- TuP1-21 T. Zorenko  *$\text{Ce}^{3+}$  doped  $\text{Al}_2\text{O}_3\text{-YAG}$  eutectics as converters for WLED application*
- TuP1-22 O. Zapadlík *Engineering of  $\text{YAG:Ce}$  to improve its scintillation properties*
- TuP1-23 Y. Hizhnyi *Electronic properties of Mn-related defects in  $\text{YAIO}_3$  perovskite crystal*
- TuP1-24 V. Pankratova *Comparative study on the influence of swift heavy ions on structural and luminescent properties of several important optical and scintillator materials*
- TuP1-25 O. Chukova *Synthesis and properties of luminescent glass-ceramics composed of vanadate-borate glass filled with vanadate nanoparticles*
- TuP1-26 S. Nagorny *Scintillation and charge trapping properties of  $\text{Cs}_2\text{HfCl}_6$  and  $\text{Cs}_2\text{ZrCl}_6$  single crystals in a wide temperature range (remote presentation)*
- TuP1-27 V. Gayshan *New type of ultra-high (<3%) energy resolution gamma spectrometry using traditional scintillators(remote presentation)*

# POSTER SESION II

Thursday, 16.09.2021, 18:00-19:00

PARIS Center, posters hall

Chairmen's: Eduardo Yukichara, Kazimierz Fabisiak

- ThP2-1 A. Krasnikov *Electron and hole centers in the UV-irradiated Bi<sup>3+</sup>-doped Ca<sub>3</sub>Ga<sub>2</sub>Ge<sub>3</sub>O<sub>12</sub> garnet*
- ThP2-2 M. Buryi *Charge trapping in Li doped Y<sub>3</sub>Al<sub>5</sub>O<sub>12</sub> single crystals: correlated EPR and TSL investigation*
- ThP2-3 M. Sankowska *The influence of temperature on the photoluminescence of lithium fluoride crystals*
- ThP2-4 M. E. Witkowski *Low temperature thermoluminescence of β-Ga<sub>2</sub>O<sub>3</sub> scintillator – new results and new interpretations*
- ThP2-5 N. Krutyak *Novel NASICON-type phosphors doped with RE ions: structure and luminescence (remote presentation)*
- ThP2-6 S. Ubizskii *Luminescence Response of YAP:Mn crystal to the ionizing and visible radiation*
- ThP2-7 D. Spassky *Luminescent and structural properties of Sc<sub>x</sub>Y<sub>1-x</sub>VO<sub>4</sub>:Eu<sup>3+</sup> solid solutions (remote presentation)*
- ThP2-8 D. Daurenbekov *Recombination emission and electron trapping centers in irradiated BaSO<sub>4</sub> and CaSO<sub>4</sub> (remote presentation)*
- ThP2-9 A. Luचेchko *TL and OSL studies of Mn<sup>2+</sup> and Eu<sup>3+</sup>-doped MgGa<sub>2</sub>O<sub>4</sub> phosphor*
- ThP2-10 S. Motta *Characterization of Leksyg Smart automated reader for TL and OSL dosimetry using various materials*
- ThP2-11 A. Maratova *Effect of exciton-like luminescence flare-up in the field of homologous cations in KCl matrix (remote presentation)*
- ThP2-12 A. Majewski-Napierkowski *Regularities of manganese charge state formation and luminescent properties of Mn doped Al<sub>2</sub>O<sub>3</sub>, YAlO<sub>3</sub> and Y<sub>3</sub>Al<sub>5</sub>O<sub>12</sub> single crystalline films*
- ThP2-13 V. Chernov *Evaluation thermal quenching parameters from a series of experimental thermoluminescence curves recorded with variable heating rates (remote presentation)*
- ThP2-14 A. K. Somakumar *Temperature dependent photoluminescence studies on Mn doped Y<sub>3</sub>Al<sub>5</sub>O<sub>12</sub> single crystalline films*
- ThP2-15 M.-Y. Shih *Execution of personal and extremity dosimeters proficiency tests regarding dose equivalent for beta particles (remote presentation)*
- ThP2-16 M. Discher *ProGlaDos Project: TL study of protective glasses of mobile phones for retrospective dosimetry*
- ThP2-17 K. Szufa *Optically stimulated luminescence properties of commercially available KCl dietary supplement as retrospective dosimeter*
- ThP2-18 M. Biernacka *Investigations of the thermal stability of the OSL main trap in quartz from sediments*
- ThP2-19 N. Pawlak *Thermal depletion curve of the complex OSL signal*



## POSTER SESION II

- ThP2-20 R. Smyka *Luminescent properties of microcline from the granite pegmatite of the Strzegom Massif*
- ThP2-21 C. Bassinet *ProGlaDos Project - Mobile phone screen protector glass for radiation accident dosimetry: TL investigation of the intrinsic background signal (remote presentation)*
- ThP2-22 R. Majgier *Comparison of OSL properties of sodium sulfate and potassium sulfate*
- ThP2-23 E. Mandowska *Investigation of feldspar luminescence decay using pulsed IRSL measurement*
- ThP2-24 L. Oster *Investigation of the dose-rate effects in the thermoluminescence of LiF:Mg,Ti (TLD-100) (remote presentation)*
- ThP2-25 B. Rikhotso *Atomistic simulation synthesis of  $\text{Li}_x\text{TiO}_2$  nanoporous as anode electrode materials for energy storage in lithium ion batteries (remote presentation)*

# PARTNERS

The LUMDETR 2021 Committees thank their partners:

**Kazimierz Wielki University in Bydgoszcz**

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# crystals

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## Special Issue "Crystals, Films and Nanocomposite Scintillators (Volume II)"

A special issue of *Crystals* (ISSN 2073-4352). This special issue belongs to the section "Inorganic Crystalline Materials".

Deadline for manuscript submissions: **31 December 2021**.

### Special Issue Editor

**Prof. Dr. Yuriy Zorenko** [E-Mail](#) [Website](#)

*Guest Editor*

Institute of Physics, Kazimierz Wielki University in Bydgoszcz, Bydgoszcz, Poland

**Interests:** scintillators; development of luminescent materials in the single crystalline and crystals forms; energy transfer processes in scintillators; defects and dopant as emission and trapping centers in dielectrics

**Special Issues and Collections in MDPI journals**

Scintillator materials are known as the spectral and energy transformers of high-energy photons from X- or  $\gamma$ -ray ranges into a ultraviolet-visible (UV/VIS) light. The accelerated particles (electrons, protons, neutrons, or heavy ions) can also be detected through their energy deposits in scintillator materials, which convert their energy into light.

The aim of this Special Issue is to introduce and describe in more detail the current status of research and development of bulk, ceramic, film, and nanocomposite scintillators, prepared using different technological methods. Both technological descriptions and the various characterization aspects of scintillation materials, together with application aspects in the abovementioned fields, will be provided.



# materials

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## Special Issue "Materials for Luminescent Detectors and Transformers of Ionizing Radiation"

A special issue of *Materials* (ISSN 1996-1944). This special issue belongs to the section "Optics and Photonics".

Deadline for manuscript submissions: **30 June 2022**.

### Special Issue Editors

**Prof. Dr. Yuriy Zorenko** [E-Mail](#) [Website](#)

*Guest Editor*

Institute of Physics, Kazimierz Wielki University in Bydgoszcz, Bydgoszcz, Poland

**Interests:** scintillators; development of luminescent materials in the single crystalline and crystals forms; energy transfer processes in scintillators; defects and dopant as emission and trapping centers in dielectrics

**Special Issues and Collections in MDPI journals**

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**Prof. Dr. Kazimierz Fabisiak** [E-Mail](#) [Website](#)

*Guest Editor*

Institute of Physics, Kazimierz Wielki University, Bydgoszcz, Poland

**Interests:** CVD diamond; thin nono- and microcrystalline films; diamond single crystal; optical spectroscopy

**Special Issues and Collections in MDPI journals**

Significant achievements in recent years in the synthesis of new luminescence compounds in the different crystalline forms resulted in easy access of engineers and designers to these materials for creation of various detectors of ionizing radiation for application in the different branches of industry and science. These new materials offer solutions that can shift performance of respective devices to new levels and enabling completely new approaches to challenging problems, especially in the medical diagnostic.

This special issue of Material „Materials for Luminescent Detectors and Transformers of Ionizing Radiation" will be a forum for the presentation of the latest developments in basic and applied research in the field of radioluminescence, the processes of energy transfer and storage in solids, the physics and chemistry of luminescent phosphor and scintillation materials, and related with them applications.



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