

# CURRICULUM VITAE

**Artur Bednarkiewicz**

**Place of work:** Polish Academy of Sciences  
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## EDUCATION and PROFESSIONAL ACTIVITIES:

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| <b>05.2022</b>         | Head of Division of Biomedical Physicochemistry   |
| <b>07.2020</b>         | Full professor in Institute of Low Temperatures and Structure Research, Polish Academy of Sciences, Wrocław, Poland   |
| <b>01.2017-05.2018</b> | Director of Scientific Department in Wrocław Research Centre EIT+   |
| <b>04.2015</b>         | professorship in Institute of Low Temperatures and Structure Research, Polish Academy of Sciences, Wrocław, Poland  |
| <b>06.2014</b>         | member of Young European Academy  |
| <b>06.2013</b>         | habilitation on „Luminescent properties of lanthanide doped fluoride nanoluminophores”, Poland  |
| <b>2011-04.2019</b>    | Researcher at Polish Center for Technology Development (previously Wrocław Research Centre EIT+) Wrocław, Poland  |
| <b>2009-</b>           | Researcher in Institute of Low Temperatures and Structure Research, Polish Academy of Sciences, Wrocław, Poland   |
| <b>2005-2008</b>       | post-doc position in European Commission - Joint Research Centre, Institute for Health and Consumer Protection, Nanomaterials and Molecular Imaging, Ispra, Italy |
| <b>2003-2005</b>       | Researcher in Institute of Low Temperatures and Structure Research, Polish Academy of Sciences, Wrocław, Poland   |
| <b>2003</b>            | Ph.D. - ‘Spectral and laser properties of Yb <sup>3+</sup> doped crystals and glasses’ - Institute of Low Temperatures and Structure Research, PAN, Wrocław       |
| <b>1998</b>            | M.Sc. - ‘Generation of 2 <sup>nd</sup> harmonic of Neodymium Laser Pumped with Laser Diode’ - Institute of Low Temperatures and Structure Research, PAN, Wrocław  |
| <b>1993-1998</b>       | Technical University of Wrocław, Poland - Department of Basic Problems of Technology, Application of Electronics in Medicine, 1993-1998                           |

## RECENT GRANTS:

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- *Photon avalanche in nano and micro- inorganic crystals doped with lanthanide ions, a PI, NCN OPUS 2018/31/B/ST5/01827 (09.2019-08.2022)*
- *Theoretical and Experimental Devising Photon Avalanche Emission Nanoparticles, a PI, Molecular Foundry #5973, U.S. Department of Energy National Laboratory Operated by the University of California*
- *Uczulanie luminoforów domieszkowanych lantanowcami poprzez jony metali przejściowych dla termometrów o wysokiej jasności, BEETHOVEN CLASSIC 3, NCN, researcher*

- "Nanoparticles-based 2D thermal bioimaging technologies", NanoTBTech FETOPEN-01-2016-2017 within H2020-FETOPEN-2016-2017, a PI of Polish partner of the consortium, 09.2018-09.2021
- „Photon Avalanche based Optical Thermometry” / „Termometria luminescencyjna bazująca na lawinowej emisji fotonów”, a researcher, budget 1.5 mln PLN 2018-2021
- „Multifunctional Optical Trapping and Optical Microrobots to study localized hyperthermia of cells and cellular spheroids from primary cell cultures” / „Opracowanie multifunkcyjnych szczypiec optycznych i mikrorobotów do badania wpływu zlokalizowanej hipertermii na komórki i sferoidy nowotworowe uzyskane z hodowli pierwotnych”, NCN OPUS 14, 2018-2021, PI of one of the partners of the consortium
- "The European Upconversion Network From the Design of Photon-upconverting Nanomaterials to (Biomedical) Applications" – EU COST Action CM1403, co-applicant, Short Term Scientific Mission Manager
- "Lanthanide doped colloidal core-shell nanoparticles: synthesis and active modulation of spectral properties", task leader, grant from National Research Center, Poland, 4.2013-4.2018,
- „Exploitation of electrical, spectral and optical methods in biodetection and bioimaging” – EIT+ Wrocław Research Centre, task leader (1.2011-6.2015)
- Lanthanide doped nanoluminophores as active elements In biosensors, task leader (2010-2012), grant MNISW NN 507 58 49 38
- Synthesis and spectral properties of biocompatible nanocomposites: SiO<sub>2</sub> and lanthanide doped fluoride nanocrystals as selective luminescent markers In bioapplications, grant MNISW NN 507499538, (2010-2012), researcher
- Nano biotechnologies for health application Nano BioTech, FP6, action 4221. Researcher, topic – development of advanced fluorescence spectroscopy methods for imaging and sensing in vitro
- In vitro testing technologies and assay automation InViTech, FP6, action 4224, Researcher, topic: Noninvasive and non-destructive cytotoxicity studies in vitro

## EXPERIENCE:

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- Consultant of · LaserSecura Ltd. (medical lasers, software), Wrocław Poland; · MediCom Ltd. (software, video diagnosis equipment) Wrocław, Poland; · Optel Ltd. (document/banknotes protection, optical components) Wrocław, Poland; · Haemato GmbH (photodynamic cancer diagnosis and treatment) Berlin, Germany, .
  - A co-owner of Nanovectors spin-off company (2012-2018), Lantalux spin-off (2016-2018)
  - Member of the Organising Committee of the following international conferences: International Conference on Luminescence ICL'14 Wrocław (2014), International Conference on f-elements (2005), International Symposium on New Trends in Photodynamic therapy and Diagnosis (2004), Rare-earth systems (2003), Excited State of Transition Elements (2001); Organiser and chairman of 1st European Conference and Spring School on Properties and Applications of Upconverting Nanoparticles 2016 Wrocław
  - Reviewer in scientific journals (Nature Nanotechnology x2, Nature Photonics x2, Nature Materials x2, ACS Nano x3, Nat.Comm.x5, Nature Sci.Reports x2, Chem.Soc.Rev x3, Nano Letters x1, ACS Photonics x2, ACS Appl.Mat. x1, ACS App.Nano.Mat x1, Optical Materials x30, Light:Science&Applications x6, J.Luminescence x22, Optics Express x2, Journal of the American Chemical Society x3, Small x3, ACS The Journal of Physical Chemistry, 1x PCCP, 3x RSC J.Materials Chemistry C, Advanced Materials, Advanced Photonics Research x2, RSC Advances x5, RSC Nanoscale 16x, RSC Nanoscale Advances x1, RSC Nanoscale Horizon x1, Materials Science & Engineering, Toxicology Letters, Advanced Optical Materials x6, ACS Applied Materials & Interfaces x5, ACS Omega x1, Coord.Chem.Rev. x1, RSC Chemical Communications x2, JBO x1, 11x RSC Dalton Transactions, IOP Nanotechnology, Sensors and Actuators B:Chemical x1, Applied Surface Science x1, Springer Series "Bioanalytical Reviews", Industrial & Engineering Chemistry Research., Nanophotonics x4, J.Nanoparticle Research 3x, J.Mat.Chem.B x2, Photochemical & Photobiological Sciences x2, Optics & Laser Technology x1, Methods and Applications in Fluorescence x3, Journal of Hazardous Materials x1,

J.Alloys&Compounds 16x, Journal of Applied Physics 4x, AIP APL x2, ChemPhysChem x2, Dyes and Pigments, Nano-Micro-Letters x1, Analytical Chemistry x2, Methods and Applications in Fluorescence x1, Chemical Engineering Journal 2x, Applied Physics Express x1, J.Fluorine Chemistry 1x)

- Reviewer / evaluator of grant proposals (8x REA FET Open, 62x cross—reader REA FET Open (2016–2022), 18x Preludium NCN, 4x Foundation for Polish Science, 2x NCN Preludium, 17x NCN Opus, Marsden Fund Proposal (Australia), x35 Short Term Scientific Mission reviewer and manager within COST1403 EU action), InterTalentum (Spain 2016), 2x Research Foundation Flanders (Fonds Wetenschappelijk Onderzoek - Vlaanderen, FWO), Czech National Science Foundation (2018), Research Grants Council of Singapore(2020), 2x Social Sciences and Humanities Research Council of Canada (2020)
- Lecturer of specialised medical courses concerning lasers applications in diagnosis and treatment, occasionally lecturer in Technical University Wroclaw; lecturer during Festival of Science in Wroclaw (2001,2003, 2011, 2013), Scientific Nights (2017), University of Kids (2016, 2018) Poland
- Supervisor of several M.Sc. theses concerning lanthanide spectroscopy, solid-state lasers, biospectroscopy, lasers and medical applications of light. Two of the students received prizes for best M.Sc. thesis (p.D.Wawrzynczyk – Polish Physical Society, Pawel Gacek-Stowarzyszenie Elektryków Polskich), (• J.Zasada Politechnika Wroclawska 2019, • M.Pawliszewska Politechnika Wroclawska 2014, • A.Darecki Politechnika Wroclawska 2012, • B.Gajdzis Politechnika Wroclawska 2012, • A.Wajdzik Politechnika Wroclawska 2012, • D.Mosio Politechnika Wroclawska 2010, • K.Mokrzycka Wydział Fizyki, UWr 2011; 2012 • Justyna Dobosz Wydział Fizyki, UWr 2011, • D.Wawrzyńczyk Politechnika Wroclawska 2011, • K.Jakubczyk Politechnika Wroclawska 2005, • J.Lewandowski Politechnika Wroclawska 2005, • P.Gacek Politechnika Wroclawska 2005)
  - Magistranci
  - Stageries: Adrian Kain (PWr2020), Jakub Nalewaj (PWr2020), Teresa Sembratowicz (PWr2020), Barbara Kamińska (Pwr 2020), Malgorzata Korona (PWaw2020)
- Promotor of 3 Ph.D. theses
  - Dr Katarzyna Prorok – The impact of active and passive dopants on the spectroscopic properties of Yb and Tb doped NaYF<sub>4</sub> colloidal nanocrystals, 11.2016, , defense with distinctions
  - dr Malgorzata Misiak – The influence of active and passive ions' doping on the spectroscopic properties of colloidal NaYF<sub>4</sub> nanocrystals doped with Yb<sup>3+</sup> and Tm<sup>3+</sup>, 11.2016, defense with distinctions
  - dr Aleksandra Pilch 11.2020– The impact of composition and chemical architecture on the luminescent properties of colloidal NaYF<sub>4</sub> nanoparticles co-doped with Yb<sup>3+</sup> i Ho<sup>3+</sup>, 11.2018, defense with distinctions
  - mgr Agata Kotulska – Forster Resonant Energy Transfer with lanthanide doped nanoparticles
  - mgr Magdalena Dudek
  - mgr Zuzanna Korczak
  - Three of the ph.d. candidates defended their theses with distinctions (INTiBS PAN)
- opponent to Ph.D. thesis of
  - Laura Pihlgren, "Nir-Vis Up-Conversion Luminescence In The Yb<sup>3+</sup>,Er<sup>3+</sup> Doped Y<sub>2</sub>O<sub>3</sub>S, ZrO<sub>2</sub>, And NaYF<sub>4</sub> Nanomaterials" Turun Yliopisto, University Of Turku, Turku (2015)
  - *Monirehalsadat Mousavi entitled „Luminescence Spectroscopy For Biomedical Applications”, Lund University, Szwecja (2019)*
- reviewer of Ph.D. theses
  - M.Sc. Riikka Arppe "Photon Upconverting nanophosphors: unique reporters for biomedical biosensing" Turun Yliopisto, University Of Turku, Turku (2016)
  - mgr Ewa Kasprzycka (Chemistry Department, Wroclaw University) „Kompleksy lantanowców z sulfonyloamidofosforanami jako konwertery promieniowania

elektromagnetycznego – synteza, struktura i spektroskopia” (2018)

- mgr eng. Kacper Parafiniuk (Chemistry Department, Wrocław University of Science and Technology) „Wybrane organiczne ośrodki wzmacniające do uzyskiwania przestrajalnej akcji laserowej typu DFB”

## PUBLICATIONS:

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### 2022

1. Lanthanide-doped Heterostructured Nanocomposites toward Advanced Optical Anti-Counterfeiting and Information Storage" by Lining Sun, Yao Xie, Yapai Song, Guotao Sun, Pengfei Hu, and Artur Bednarkiewicz, LSA20220216RR
2. Photon avalanche in nanoparticles goes multicolour, A.Bednarkiewicz\* and M.Szalkowski, Nature Nanotechnology, News & Views DOI 10.1038/s41565-022-01100-9
3. *Engineering architecture of core-shell upconverting lanthanide-doped nanoparticles for optimal donor in resonance energy transfer*, Aleksandra Pilch-Wrobel, Agata M. Kotulska, Satu Lahtinen, Tero Soukka\*, Artur Bednarkiewicz\*, *Small* 2022, e2200464, doi: 10.1002/smll.202200464.
4. Highly sensitive luminescence nanothermometry and thermal imaging facilitated by phase transition, L.Marciniak, W.Piotrowski, M.Szalkowski, V.Kinzhybalo, M.Drozd, M.Dramicanin, A.Bednarkiewicz, *Chemical Engineering Journal*, Volume 427, 1 January 2022, 131941
5. Phase transition-driven highly sensitive, NIR-NIR band-shape luminescent thermometer based on LiY02:Nd3+ , L. Marciniak\*, W. Piotrowski, M. Drozd, V. Kinzybahlo, A. Bednarkiewicz, M. Dramicanin, accepted to *Applied Optical Materials*
6. A single-band ratiometric luminescent thermometer based on tetrafluorides operating entirely in the infrared region, Trejgis Karolina, Ledwa Karolina Anna, Bednarkiewicz Artur [et al.], *Nanoscale Advances*, 2022, vol. 4, no. 2, pp.437-446. DOI:10.1039/d1na00727k

### 2021

1. Impact of host composition and dopant ion concentration on the thermometric properties of a Eu3+ activated fluoride-based single-band ratiometric luminescent thermometer, K. Trejgis, K. Ledwa, A. Bednarkiewicz, L. Marciniak, *Journal of Alloys and Compounds*, 2021, 162839,
2. From structural phase transition to highly sensitive lifetime based luminescent thermometer: multifaceted modification of thermometric performance in Y0.9-xNd<sub>x</sub>Yb0.1PO<sub>4</sub> nanocrystals, K. Maciejewska,\* M. Szalkowski, A. Bednarkiewicz and L. Marciniak\*, *J. Mater. Chem. C*, 2021,9, 15831-15839
3. Predicting the impact of temperature dependent multi-phonon relaxation processes on the photon avalanche behavior in Tm3+: NaYF<sub>4</sub> nanoparticles, M. Szalkowski, M. Dudek, Z. Korczak, C. Lee, Ł. Marciniak, E.M. Chan, P.J.Schuck, A. Bednarkiewicz\*, *Optical Materials: X* (2021)12, 100102, doi: <https://doi.org/10.1016/j.omx.2021.100102>.
4. Laser Refrigeration by an Ytterbium Doped NaYF<sub>4</sub> Microspinner E. Ortiz-Rivero, K. Prorok, I. R. Martín, R. Lisiecki, P. Haro-González,\* A. Bednarkiewicz, D. Jaque\* *SMALL* 2021, 2103122
5. Self-Referenced Temperature Imaging with Dual Light Emitting Diode Excitation and Single-Band Emission of AVO<sub>4</sub>:Eu<sup>3+</sup> (A=Y, La, Lu, Gd) Nanophosphors, Wojciech Piotrowski, Łukasz Marciniak, Artur Bednarkiewicz; Fond, Benoit; Karolina Elźbieciak, *Advanced Photonics Research* 2021 (Open access)
6. The role of surface related quenching in the single band ratiometric approach based on excited state absorption processes in Nd<sup>3+</sup> doped phosphors, Karolina Trejgis; Feng Tian; Jiang Li; Artur Bednarkiewicz; Lukasz Marciniak, *Materials Research Bulletin*, accepted 26.02.2021
7. Correlation between the Covalency and the Thermometric Properties of Yb<sup>3+</sup>/Er<sup>3+</sup> Codoped Nanocrystalline Orthophosphates, K. Maciejewska, A. Bednarkiewicz, A. Meijerink and L. Marciniak\*, *J. Phys. Chem. C* 2021, 125, 4, 2659-2665
8. Luminescence based temperature bio-imaging: status, challenges and perspectives, A.Bednarkiewicz, J. Drabik, K. Trejgis, D. Jaque, E. Ximendes, L. Marciniak, *Applied Physics Reviews* 2021, APPLIED PHYSICS REVIEWS 8 (1) (featured article)

9. Giant nonlinear optical responses from photon avalanching nanoparticles, Changhwan Lee, Emma Xu, Yawei Liu, Ayelet Teitelboim, Kaiyuan Yao, Angel Fernandez-Bravo, Agata Kotulska, Sang Hwan Nam, Yung Doug Suh, Artur Bednarkiewicz, Bruce E. Cohen, Emory M. Chan, P. James Schuck, Nature, vol 592, no.7841 (14.01.2021) + cover page, <https://arxiv.org/abs/2007.10551>
10. The influence of the Er<sup>3+</sup>+dopant concentration in LaPO<sub>4</sub>:Nd<sup>3+</sup>, Er<sup>3+</sup> on thermometric properties of ratiometric and kinetic-based luminescent thermometers operating in NIR II and NIR III optical windows, K.Maciejewska, A.Bednarkiewicz and L.Marciniak, Nov 1 2021 | PHYSICA B-CONDENSED MATTER 620
11. NIR luminescence lifetime nanothermometry based on phonon assisted Yb<sup>3+</sup>-Nd<sup>3+</sup> energy transfer, K.Maciejewska, A.Bednarkiewicz, and L.Marciniak, Sep 7 2021 | Jun 2021 (Early Access) | NANOSCALE ADVANCES 3 (17) , pp.4918-4925
12. Standardization of Methodology of Light-to-Heat Conversion Efficiency Determination for Colloidal Nanoheaters, A.Paściak, A.Pilch-Wróbel, Ł.Marciniak, P.J.Schuck, A.Bednarkiewicz, ACS Appl Mater Interfaces. 2021 Sep 22;13(37):44556-44567. doi: 10.1021/acsami.1c12409. Epub 2021 Sep 9.

## 2020

13. *Enhancing FRET biosensing beyond 10 nm with photon avalanche nanoparticles*, A.Bednarkiewicz, E.Chan, K.Prorok, Nanoscale Adv., 2020,2, 4863-4872
14. *Standardizing luminescence nanothermometry for biomedical applications* A. Bednarkiewicz, L. Marciniak, L.D. Carlos, D. Jaque, Nanoscale 12(2020), 14405 - 14421. doi:10.1039/D0NR03568H
15. *Nd<sup>3+</sup> doped TZPN glasses for NIR operating single band ratiometric approach of contactless temperature readout* Journal of Luminescence, K.Trejgis, R.Lisiecki, A.Bednarkiewicz, L.Marciniak, Journal of Luminescence, Volume 224, August 2020, 117295
16. *Near Infrared-to-Near Infrared Excited-State Absorption in LaPO<sub>4</sub>:Nd<sup>3+</sup> Nanoparticles for Luminescent Nanothermometry*, Trejgis, Karolina; Maciejewska, Kamila; Bednarkiewicz, Artur; Marciniak, Lukasz Manuscript ACS Applied Nano Materials DOI: 10.1021/acsanm.0c00853
17. *Heterodimers Made of Metal-Organic Frameworks and Upconversion Nanoparticles for Bioimaging and pH-responsive Dual-drug Delivery*, Danping Ling, Haihong Li, Wensong Xi, Zhuo Wang, Artur Bednarkiewicz, Solomon Tiruneh Dibaba, Li-Yi Shi and Lining Sun DOI: 10.1039/C9TB02753J, Mater. Chem. B, 2020,8, 1316-1325
18. *Engineering excited state absorption based nanothermometry for temperature sensing and imaging*, K. Trejgis, A. Bednarkiewicz \* and L. Marciniak, Nanoscale, 2020, 12, 4667 - 4675 (article became part of the themed collection: Nanoscale Most Popular 2020 Articles)
19. *Assessing Thermometric Performance of Sr<sub>2</sub>CeO<sub>4</sub> and Sr<sub>2</sub>CeO<sub>4</sub>:Ln<sup>3+</sup> (Ln<sup>3+</sup> = Sm<sup>3+</sup>, Ho<sup>3+</sup>, Nd<sup>3+</sup>, Yb<sup>3+</sup>) Nanocrystals in Spectral and Temporal Domain*. L.Marciniak, K.Elzbieciak-Piecka, K.Kniec, A.Bednarkiewicz, Chemical Engineering Journal, Volume 388, 15 May 2020, 12434
20. *The Influence of Ce<sup>3+</sup> Codoping and Excitation Scheme on Spectroscopic Properties of NaYF<sub>4</sub>:Yb<sup>3+</sup>,Ho<sup>3+</sup>*. Aleksandra Pilch-Wróbel, Joanna Zasada, Artur Bednarkiewicz, Journal of Luminescence, Volume 226, October 2020, 117494
21. *Synergy between NIR Luminescence and Thermal Emission toward Highly Sensitive NIR Operating Emissive Thermometry*. Lukasz Marciniak, Karolina Trejgis, Radostaw Lisiecki, Artur Bednarkiewicz, Scientific Reports volume 10, Article number: 19692 (2020)

## 2019

1. *Single-Cell Biodetection by Upconverting Microspinners*, Elisa Ortiz-Rivero, Katarzyna Prorok, Michał Skowicki, Dasheng Lu, Artur Bednarkiewicz,\* Daniel Jaque,\* and Patricia Haro-González, Small 2019, 15(46), 1904154
2. *Near-Infrared Excited Luminescence Imaging of HeLa Cells by Using Mn<sup>2+</sup> Enhanced Tb<sup>3+</sup>, Yb<sup>3+</sup> Cooperative Upconversion in NaYF<sub>4</sub> Nanocrystals*, Katarzyna Prorok, Michał Skowicki, Agnieszka Kowalczyk, Tomasz Lipiński, Artur Bednarkiewicz, Nanoscale Adv., 2019,1, 3463-3473
3. *Enhancing the sensitivity of Nd<sup>3+</sup>, Yb<sup>3+</sup>:YVO<sub>4</sub> nanocrystalline luminescent thermometer by*

- host sensitization, *Physical Chemistry Chemical Physics*, 21(20), 2019, 10532–10539
4. Photon avalanche in lanthanide doped nanoparticles for biomedical applications: super-resolution imaging, Artur Bednarkiewicz, Emory Ming-Yue Chan, Agata Maria Kotulska, Lukasz Marciniak and Katarzyna Prorok, *Nanoscale Horizons*, 4(3), 2019, 706–719, DOI: 10.1039/c9nh00089e
  5. Spectral properties of Tm<sup>3+</sup> doped NaYF<sub>4</sub> up-converting nanoparticles under single and double photoexcitation wavelengths Kotulska, Agata; Prorok, Katarzyna; Bednarkiewicz, Artur, *Methods and Applications of Fluorescence*, 7(3), 2019, 034001, 2019
  6. Fluorescent electrospun PMMA microfiber mats with embedded NaYF<sub>4</sub>: Yb/Er upconverting nanoparticles, Antoniadou, Myrto; Pilch-Wrobel, Aleksandra; Riziotis, Christos; Bednarkiewicz, Artur; Tanasă, Eugenia; Krasia-Christoforou, Theodora, *Methods and Applications of Fluorescence* 7(3), 2019, 034002
  7. Forster Resonance Energy Transfer-Activated Processes in Smart Nanotheranostics Fabricated in a Sustainable Manner, Dominika Wawrzyńczyk, Urszula Bazylińska, Łukasz Lamch, Julita Kulbacka, Anna Szewczyk, Artur Bednarkiewicz, Kazimiera A. Wilk and Marek Samoć, *CHEMSUSCHEM* Volume: 12 Issue: 3 Pages: 706–719 Published: FEB 7 2019 (IF=7.411)
  8. Critical considerations on the clinical translation of upconversion nanoparticles (UCNPs) - Recommendations from the European Upconversion Network (COST Action CM1403), Helena Oliveira, Artur Bednarkiewicz, Andreas Falk, Eleonore Fröhlich, Darja Lisjak, Adriele Prina-Mello, Ivana Vinković Vrček, Edyta Wysokińska, Hans H. Gorris, *ADVANCED HEALTHCARE MATERIALS* 8(1), 2019, 1801233 (IF=5.609)
  9. Toxicity Mechanism of Low Doses of NaGdF<sub>4</sub>:Yb<sup>3+</sup>,Er<sup>3+</sup> Upconverting Nanoparticles in Activated Macrophage Cell Lines, Wysokinska, Edyta; Cichos, Jakub; Kowalczyk, Agnieszka; Karbowski, Mirosław; Strzadala, Leon; Bednarkiewicz, Artur; Kalas, Wojciech, *BIOMOLECULES* 9(1), 2019, 14
  10. A new forum for upconversion research: the UPCON conference, Gorris, Hans H.; Soukka, Tero; Bednarkiewicz, Artur; et al. *METHODS AND APPLICATIONS IN FLUORESCENCE* Volume: 7 Issue: 3 Article Number: 030201 Published: JUL 2019

## 2018

1. NIR-NIR photon avalanche based luminescent thermometry with Nd<sup>3+</sup> doped nanoparticles, Lukasz Marciniak, Artur Bednarkiewicz and Karolina Elzbieciak, *J. Mater. Chem. C*, 2018, 6, 7568 (HOT Papers themed collection), (IF/CIT=6.87/0)
2. Optical forces at the nanoscale: size and electrostatic effects, P.Rodríguez-Sevilla, K. Prorok, A.Bednarkiewicz, M.Marqués, A.García-Martín, J.Garcia Sole, P.Haro-González, D.Jaque, *Nano Lett.*, 2018, 18 (1), pp 602–609 (IF/ CIT = 12.712/0)
3. [Advances in highly doped upconversion nanoparticles](#), by Shihui Wen, Jiajia Zhou, Kezhi Zheng, Artur Bednarkiewicz, Xiaogang Liu, and Dayong JIN [Paper #NCOMMS-17-31904B], [Nature Communications vol 9, Article number: 2415 \(2018\)](#) (IF/CIT=12.124/0)
4. Temperature sensitivity modulation through crystal field engineering in Ga<sup>3+</sup> co-doped Gd<sub>3</sub>Al<sub>5-x</sub>Ga<sub>x</sub>O<sub>12</sub>:Cr<sup>3+</sup>, Nd<sup>3+</sup> nanothermometers, Elzbieciak, K.; Bednarkiewicz, A.; Marciniak, L., *SENSORS AND ACTUATORS B-CHEMICAL* Volume: 269 Pages: 96–102 Published: SEP 15 2018 (IF/CIT=5.667/1)
5. Quantum yield measurements of Yb, Ho co-doped upconverting nanomaterials: The impact of methods, reference materials and concentration, A.Pilch-Wrobel, B.Czaban, D.Wawrzyńczyk, A.Bednarkiewicz, *J. Luminescence*, Volume 198, June 2018, Pages 482–487 (IF/CIT=2.732/0)

## 2017

6. Phosphor Assisted Temperature Sensing and Imaging using resonant and non-resonant photoexcitation scheme, Bednarkiewicz, Artur; Trejgis, Karolina; Drabik, Joanna; Kowalczyk, Agnieszka; Marciniak, Lukasz, *ACS Applied Materials & Interfaces*, 2017 Dec 13;9(49):43081–43089. doi: 10.1021/acsami.7b13649 (IF/CIT=7.504/1)
7. Shaping luminescent properties of Yb<sup>3+</sup> and Ho<sup>3+</sup> Co-doped Up-converting Core-shell □-NaYF<sub>4</sub> nanoparticles by dopant distribution and spacing, Aleksandra Pilch, Christian Würth, Martin Kaiser, Dominika Wawrzyńczyk, Michalina Kurnatowska, Sebastian Arabasz,

Katarzyna Prorok, Marek Samoć, Wiesław Strek, Ute Resch-Genger\* and Artur Bednarkiewicz\* *Small* 2017 10, 1701635 (IF/CIT=8.64/3)

8. Size dependent sensitivity of Yb,Er up-converting luminescent nano-thermometers L.Marciniak, A. Bednarkiewicz, K. Prorok, W. Strek, J. Mater. Chem. C, 2017,5, 7890–7897 DOI: 10.1039/C7TC02322G (IF/CIT= 5.256/18)
9. Towards controlled photothermal treatment of single cell: Optically induced heating and remote temperature monitoring in-vitro through double wavelength optical tweezers, Sławomir Drobczyński, Katarzyna Prorok, Konstantin Tamarov, Kamila Duś-Szachniewicz, Vesa-Pekka Lehto, Artur Bednarkiewicz, *ACS Photonics*, 2017, 4 (8), pp 1993–2002, DOI: 10.1021/acsp Photonics.7b00375 (IF/CIT=6.756/1)
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34. Synthesis, structure and preliminary spectral properties of  $\text{K4RE0.01W10.99O35}$  hexatungstate bronze-like crystals (RE = Er, Eu). Macalik, L., Hanuza, J., Maczka, M. et al., (2004). *Journal Of Alloys And Compounds*, (2004)

#### 2003

35. On spectroscopic properties of the  $\text{KYb(WO}_4)_2$ :  $\text{Pr}^{3+}$  crystal, .Deren, A.Bednarkiewicz, R.Mahiou and W.Strek, *Molecular Physics*, 101(7), 951-960 (2003)
36. Medium power ytterbium lasers, A.Bednarkiewicz, J. Kalisky, W. Stręk, *Proc. SPIE Vol. 5230(2003)* 139-142, *Laser Technology VII: Progress in Lasers*; Wiesław L. Wolinski, Zdzisław Jankiewicz, Ryszard S. Romaniuk; Eds.
37. Hot Emission in  $\text{Nd}^{3+}/\text{Yb}^{3+}$ :YAG nanocrystalline ceramics, A.Bednarkiewicz, D.Hreniak, P.Dereń, W.Stręk, *J.Lumin.* 102-103, 438-444, (2003)

#### ...-2002

38. Laser-induced hot emission in  $\text{Nd}^{3+}/\text{Yb}^{3+}$ :YAG nanocrystallite ceramics, A.Bednarkiewicz and W.Strek, *J. Phys. D: Appl. Phys.* 35(20), 2503-2507, (2002)
39. In vitro photodynamic diagnosis of atherosclerotic wall changes with use of mono-l-aspartyl chlorin e6, D.Biały, A.Derkacz, M.Wawrzynska, A.Bednarkiewicz, P.Ziolkowski, H.Nowosad, W.Strek, *Polish Cardiology*, 23 175-178, (2002)
40. Power dependence of luminescence of  $\text{Tb}^{3+}$  doped  $\text{KYb(WO}_4)_2$  crystal, W. Strek, A. Bednarkiewicz and P. J. Deren, *Journal of Luminescence*, 92(3), 229-235, (2001)

41. Cooperative processes in KYb(WO<sub>4</sub>)<sub>2</sub> crystal doped with Eu<sup>3+</sup> and Tb<sup>3+</sup> ions, W. Strek, P. Deren and A.Bednarkiewicz, Journal of Luminescence, 87-89, 999-1001, (2000)
42. Efficient up-conversion in KYb<sub>0.8</sub>Eu<sub>0.2</sub>(WO<sub>4</sub>)<sub>2</sub> crystal, W. Strek, P. J. Deren, A.Bednarkiewicz, Y. Kalisky and P. Boulanger, Journal of Alloys and Compounds, 300-301, 180-183, (2000)

#### BOOK CHAPTERS

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- A.Bednarkiewicz and W.Strek, "**Interaction of light and living matter**" in "*Photodynamic Therapy and Diagnosis*" ed. H.Podbielska, A.Sieron and W.Strek, (in Polish) Urban&Partner 2003, 33-88
- Active-Core-Active-Shell Upconverting Nanoparticles: novel mechanisms, features and perspectives for bio-labeling Katarzyna Prorok, Dominika Wawrzyńczyk, Małgorzata Misiak, Artur Bednarkiewicz\*, Chapter 9, Upconverting Nanomaterials: Perspectives, Synthesis, and Applications, Ed. Claudia Altavilla ISBN 9781498707749, CRC Press Published October 10, 2016
- L. Marciniak, K. Kniec, K. Elzbieciak, and A. Bednarkiewicz, *Non-plasmonic NIR-Activated Photothermal Agents for Photothermal Therapy*, Chapter 14 in Springer Nature Switzerland AG 2019, A. Benayas et al. (eds.), Near Infrared-Emitting Nanoparticles for Biomedical Applications, [https://doi.org/10.1007/978-3-030-32036-2\\_12](https://doi.org/10.1007/978-3-030-32036-2_12)

#### PATENTS APPLICATIONS:

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- 2021** Polish patent application P.437330 Układ pomiarowy oraz sposób do wyznaczania sprawności konwersji światła z zakresu VIS i NIR na ciepło w nanomateriałach koloidalnych, A.Paściak, **A.Bednarkiewicz**, Ł.Marciniak (17.03.2021, **P.437330**)
- 2018** Polish patent application P.425031(27-03-2018) Sposób wysokorozdzielczego obrazowania fluoroscencyjnego wykorzystujący nanoluminofory domieszkowane jonami lantanowców, zastosowanie sposobu do wysokorozdzielczego obrazowania fluoroscencyjnego poniżej limitu dyfrakcji i układ pomiarowy realizujący sposób, **A.Bednarkiewicz** (Wroclaw Research Center EIT+)
- 2018** P.425598 (17-05-2018) Sposób detekcji biomolekuł oraz nanorozmiarowe znaczniki luminescencyjne, **A.Bednarkiewicz**, K.Prorok (WCB EIT+)
- 2017** PCT/PL2017/050015 - A luminescence detector for temperature measurement and a method of non-contact temperature measurement of the objects. - pending Ł. Marciniak, **A. Bednarkiewicz**, D. Hreniak, W. Strek
- 2016** P.416543 - Detektor luminescencyjny przeznaczony do pomiaru temperatury oraz sposób bezkontaktowego pomiaru temperatury obiektów - zgłoszony Ł. Marciniak, **A. Bednarkiewicz**, D. Hreniak, W. Strek
- 2016** Zgłoszenie patentowe P.416543 Ł. Marciniak, **A. Bednarkiewicz**, D. Hreniak, W. Strek, Wykorzystanie specyficznej kombinacji jonów do zastosowań w termometrii optycznej
- 2015** Sposób detekcji i selekcji komórek hybrydomalnych produkujących pożądane przeciwciała, PL413909, M.Skowicki, T.Lipinski, **A.Bednarkiewicz** (WCB EIT+)
- 2015** Zgłoszenie patentowe No PCT/PL2015/000080. Ł. Marciniak, D. Hreniak, **A. Bednarkiewicz**, W. Stręk Source of broadband white light generated on oxide matrices highly doped with rare earth ions, excited by infrared radiation
- 2015** WO2015178785A1 - Source of broadband white light generated on oxide matrices highly doped with rare earth ions, excited by infrared radiation Ł. Marciniak, **A. Bednarkiewicz**, D. Hreniak, W. Strek
- 2015** EP3146014A1 - Source of broadband white light generated on oxide matrices highly doped with rare earth ions, excited by infrared radiation - PENDING Ł. Marciniak, **A. Bednarkiewicz**, D. Hreniak, W. Strek
- 2015** US15312105 - Source of broadband white light generated on oxide matrices highly doped with rare earth ions, excited by infrared radiation - PENDING Ł. Marciniak, **A. Bednarkiewicz**, D. Hreniak, W. Strek
- 2010** European Patent Markers for protection valuable liquid and solid materials, International submission number 1600000729, PCT/PL2010050047

## PATENTS GRANTED:

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- 2009** Markers for protection valuable liquid and solid materials, PL patent granted P388780, 12.08.2009
- 2007** European Patent P-2795/MF, disclosure date 01-06-2007 "Method of fluorescence imaging"
- 2005** Polish patent P375249, disclosure date 20-05-2005, " A method of assessing the stage of development and spreading of cancer and a device to assess the stage of development and spreading of cancer"
- 2013** patent pt Sposób wysokorozdzielczego obrazowania fluoroscencyjnego oraz zastosowanie nanoluminoforów domieszkowanych jonami lantanowców do wysokorozdzielczego obrazowania fluoroscencyjnego, PL 226610 from 23.10.2013
- 2014** Patent No P.408282 Ł. Marciniak, D. Hreniak, A. Bednarkiewicz, W. Stręk, Źródło szerokopasmowego światła białego generowanego na matrycach tlenkowych wysoko domieszkowanych jonami metali ziem rzadkich, wzbudzanego promieniowaniem podczerwonym (21.05.2014)
- 2019** **patent NR 233598 (zgL.p..422277)** - Sposób bezkontaktowego optycznego pomiaru temperatury obiektów – zgłoszony, Ł. Marciniak, **A. Bednarkiewicz**

## SCIENCE POPULARISATION

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- **2015-2019 Nano engineering at nanoscale the advantages of active-core-active-shell approach to design efficient up-converting nanoparticles** – wykłady w ramach "Letnie, Warsztaty Naukowe Niskie Łąki" in ILT&SR
- **2001, 2003, 2011, 2013, 2019** – lecturer during Festival of Science – Wrocław, Polska
- **2018 "Nanomedicine", lecture for Children University (8-10 years old children), Wrocław**
- **2017 „Bariery w Zarządzaniu i Wdrażaniu Projektów Innowacyjnych” IX International Scientific Conference, Current problems in Management of Companies, Szczyrk, Poland, 23-25.06.2016 r., wykład proszony**
- **2017 "A few words on being a scientist..." lecture during Academia Europea workshop, Wrocław**
- **2017 "Scientific Night" – experiments for Wrocław inhabitants**
- **2016 "Nanomedycyna", lecture for UniKids-Uniwersytetu Dziecięcego (dzieci lat 12-15), Wrocław**
- **2016 Widening European Participation: Polish and private perspective, warsztaty Komisji Europejskiej (European Research Council, Academia Europea, Young Academy of Sciences, COST, FET), Bruksela**
- **06.2014** członek Young European Academy
- Współorganizator: · International Conference on Luminescence ICL'14 Wrocław (2014), · International Conference on f-elements (2005), · International Symposium on New Trends in Photodynamic therapy and Diagnosis (2004), · Rare-earth systems (2003), · Excited State of Transition Elements (2001)
- **2016** Chairman I główny organizator 1<sup>st</sup> European Conference and Spring School on Properties and Applications of Upconverting Nanoparticles (UPCON'16), Wrocław, Poland
- Członek Komitetu Naukowego **UPCON'16, UPCON'18, CTCT'17, UPCON'21**
- **2012-2018 The European Upconversion Network From the Design of Photon-upconverting Nanomaterials to (Biomedical) Applications – COST Action CM1403, 05.2014-05.2018** · polski reprezentant sieci, · kierownik Short Term Scientific Mission (system grantowy COST), · projektant I manager strony www sieci COST ([www.ucnp.eu](http://www.ucnp.eu))

## PRIZES:

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- 2021** prize from director of ILT&SR PAS for the most cited paper in 2017-2020
- 2017** prize from director of ILT&SR PAS for the best scientific achievement in 2016
- 2017** prize from director of ILT&SR PAS for the most cited paper in 2013-2017

- 2015** prize from director of ILT&SR PAS for the best scientific achievement in 2014
- 2015** Broadband anti-Stokes white light source, from Ministry of Science and Higher Education, Poland
- 2006** winner in the 3<sup>rd</sup> Innovation Competition for the patent application, Technical University of Wroclaw for the method and device for cancer detection and monitoring
- 2004** Gold Medal on the 53<sup>rd</sup> World Exhibition of Innovation, Research and New Technology - Brussels Eureka for the invention in the field of medical diagnosis
- 2004** Conference Grant from Towarzystwo Naukowe Warszawskie and Foundation for Polish Science
- 2004, 2005** Scholarship holder of Foundation for Polish Science
- 1996, 1997** Polish Minister of Education scholarship holder

#### **PRESENTATIONS AT UNIVERSITIES AND non-scientific MEETINGS:**

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- 4.2022** 4 Lectures on Nano-bio-Technology (Introduction to nano-bio-technology, Applications of lanthanides in nano-bio-technology, superresolution imaging with lanthanides, biosensing with lanthanides) for Wroclaw Doctoral School of Polish Academy of Sciences, Wroclaw
- 3.2022** Lawinowa emisja fotonów w nanomateriałach, seminar lecture in Department of Physics, Mikolaj Kopernik University, Torun, Poland
- 4.2021** Photon Avalanche emission in nanomaterials (WPPT seminar, Wroclaw University of Technology, remote lecture)
- 2.2021** Photon Avalanche emission in nanomaterials (Scientific Club PHOTON, Wroclaw University of Technology, remote lecture)
- 10.2020** Photon Avalanche emission in nanomaterials (ILT&SR PAS, remote lecture)
- 04.2020** Nanomateriały domieszkowane jonami lantanowców - właściwości, zastosowania i wyzwania, 04.2020 (Institute of Physics, PAS, Warsaw, remote lecture)
- 11.2016** "Widening European Participation - Young Academy of Sciences and private perspective", European Research Council Day - Academia Europea, Wroclaw
- 06.2016** IX International Scientific Conference, Current problems in Management of Companies, Szczyrk, Poland, 23-25.06.2016 r., invited lecture "Barriers In Managing And Implementation Of Innovative Projects"
- 2014** Yb and Ho co-doped active-core-active-shell up-converting nanoparticles the impact of nano-architecture on spectral properties Invited lecture invited lecture in Chemistry Department, Turku University, Finland
- 2014** LANTHANIDE DOPED NANOPARTICLES optical properties, novel up-conversion mechanisms, bio-medical applications, invited lecture at Imperial College London, Great Britain
- 2013** Competitiveness and Innovation in the Context of FET London Great Britain

#### **SCIENTIFIC PRESENTATIONS AT INTERNATIONAL CONFERENCES:**

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- 2022** **SHIFT, invited talk**
- 2022** **AMBRA, invited talk**
- 2022** **IWASOM, invited talk**
- 2021** Photon avalanching at nanoscale: challenges and new possibilities, International Conference on Luminescence (ICL2020, 07.2021) (invited lecture)
- 2021** Photon Avalanche Upconverting Nanoparticles for biomedical applications, Artur Bednarkiewicz, UPCON2021 (2021), (lecture)
- 2019** NIR-NIR photon avalanche based luminescent thermometry with Nd<sup>3+</sup> doped nanoparticles, Artur Bednarkiewicz\*, Łukasz Marciniak, Karolina Elźbieciak, IS-OM8 (2019) (lecture)
- 2018** Photon avalanche in lanthanide doped nanoparticles, A.Bednarkiewicz, 11th International



- Conference on Nanophotonics, ([www.icnp2018.org](http://www.icnp2018.org)), Wroclaw, Poland (invited) (2.07.2018)
- 2018** Superresolution imaging with Ln<sup>3+</sup> doped nanocrystals A.Bednarkiewicz, International Conference on RareEarth Materials REMAT 2018, Wroclaw, Poland (invited)
- 2018** super-resolution imaging with Ln<sup>3+</sup> doped nanocrystals, A.Bednarkiewicz, 2nd Conference and Spring School on Properties, Design and Applications of Upconversion Nanomaterials UPCON'18, Valencia, Spain (invited)
- 2017** Spectral shaping in active-core-active-shell up-converting nanoparticles the role of active-core@active-shell chemical architecture, A.Bednarkiewicz, SHIFT 2017, Tenerife Island, Spain (keynote)
- 2017** Shaping luminescent properties of up-converting □-NaYF<sub>4</sub> colloidal nanoparticles the role of Active-Core@Active-Shell chemical architecture, A.Bednarkiewicz, International Conference on Luminescence ICL 2018, Brasil (keynote)
- 2017** Quantitation of luminescent properties of Yb and Ho co-doped NaYF<sub>4</sub> colloidal nanoparticles - novel active-core-active-shell materials and novel characterization methods", A.Bednarkiewicz, CM1403 COST annual meeting, Aveiro, Portugal (lecture)
- 2017** Colloidal up-converting luminescent nanoparticles: new perspectives and applications, A.Bednarkiewicz, InterNanoPoland, Katowice, Poland, (invited)
- 2017** Up-conversion technology are all questions answered ?, A.Bednarkiewicz MRS 2017, Phoenix, USA (invited)
- 2016** with a lecture Upconverting nanoparticles for cancer theranostics, A.Bednarkiewicz, 2nd International Conference "Current Trends in Cancer Theranostics" June 19-23, 2016, Druskininkai, Lithuania (lecture +co-chairing)
- 2015** The impact of Active-Core@Active-Shell architecture on luminescent properties of Yb<sup>3+</sup> and Ho<sup>3+</sup> co-doped up-converting □-NaYF<sub>4</sub> colloidal nanoparticles, A.Bednarkiewicz, International conference IWASOM, Gdańsk (invited)
- 2015** The nano-engineering of efficient up-converting nanoparticles through active-core-active-shell approach, A.Bednarkiewicz, International conference CTCT2015: Current Trends in Cancer Theranostics. June 1-3, 2015, in Jena, Germany (invited)
- 2015** Luminescent nanoparticles for life sciences, A.Bednarkiewicz, Young Academy of Europe and Academia Europea Annual Meeting 2015, Darmstadt (invited)
- 2015** Hybrid solution for hybridoma selection, A.Bednarkiewicz, International conference on Rare-Earth Materials REMAT'15, Poland (invited)
- 2015** Nano engineering at nanoscale : the advantages of active-core-active-shell approach to design efficient up-converting nanoparticles, A.Bednarkiewicz, International Students conference PANIC, Wroclaw Univeristy of Technology, Poland (invited)
- 2014** Lanthanide doped active-core@active-shell nanoparticles: properties, applications and challenges, A.Bednarkiewicz, International Conference on Fluorescent Up-converting Nanoparticles: a Platform for Energy and Biomedical Applications, held from 4th to 6th June 2014, Torremolinos, Spain (lecture)
- 2014** Engineering optical properties of luminescent nanoparticles by active-core and active-/passive-shell approach A. Bednarkiewicz, B.Czaban, A.Pilch, D.Wawrzyńczyk, K.Prorok, M.Samoć, W.Stręć, at International Conference on Luminescence (ICL'14, Wroclaw) (lecture)
- 2014** The Photophysical Properties and Bio-Medical Applications of Up-Converting Nanoparticles at International Conferences on Laser Applications in Life Sciences, A.Bednarkiewicz, 2014 (LALS) w Ulm (invited)
- 2013** Up-converting nanoparticles in biology and medicine: properties and challenges Artur Bednarkiewicz, Dominika Wawrzynczyk, Marcin Nyk, Katarzyna Prorok, Anna Gnach, Małgorzata Misiak, Bartłomiej Cichy, Marek Samoc, Wiesław Stręć IMAMBioRA'13 (International Meeting on Advanced Materials for Bio-Related Applications) Wrocław Poland (invited)
- 2013** Up-converting nanoparticles in biology and medicine: properties and challenges Artur

Bednarkiewicz, Dominika Wawrzyńczyk, Marcin Nyk, Katarzyna Prorok, Anna Gnach, Małgorzata Misiak, Bartłomiej Cichy, Marek Samoć, Wiesław Stręka IWASOM '13 Gdansk Poland (lecture)

- 2013** Up-converting nanoparticles in biology and medicine: properties and challenges  
Artur Bednarkiewicz, D.Wawrzynczyk, Marcin Nyk, Katarzyna Prorok, Anna Gnach, Małgorzata Misiak Bartłomiej Cichy Marek Samoc, Wiesław Stręka EUROMAT 2013 European Congress and exhibition on Advanced Materials and Process Sevilla (highlighted, invited)

#### LIST OF MAJOR RESEARCH EXPEDITIONS:

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- 12.2014** Imaging upconverting nanoparticles with confocal microscope, Department of Physics, Imperial College London, Great Britain
- 10.2014** Upconversion QY measurements, BAM Federal Institute for Materials Research and Testing, Division 1.10 Biophotonics, grupa prof. Ute Resch-Genger
- 10.2013** Nanoparticle Assisted Molecular Imaging and Sensing (NAOMIS), Universität Regensburg, Institut für Analytische Chemie, Chemo- und Biosensorik
- 2008** Gastroenterologische Molekulare Zellbiologie, Medizinische Klinik und Poliklinik B, Munster, Germany (1 week) – topic: autofluorescence *in vitro*
- 2005-2008** post-doc position in European Commission - Joint Research Centre, Institute for Health and Consumer Protection, Nanomaterials and Molecular Imaging, Ispra, Italy
- 2002** University of Turku, Department of Chemistry, Department of Inorganic Chemistry Turku, Finland (2 weeks) – topic: lanthanide doped glasses
- 1998, 2001** Institute of Physics, National Academy of Sciences of Belarus, Minsk, Belarus (2 weeks each), topic: laser diode pumped solid state lasers
- 2000** research in Arava Laser Laboratory, Ben Gurion University of Negev, Be'er Sheva, Israel (June-September), topic: laser diode pumped ytterbium solid state lasers

#### PARTICIPATION IN JOB RELATED COURSES AND SCHOOLS:

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- Jul 2012** International Summer School On Fluorescent Nano-Particles In Bio-Medicine, 16-20 July 2012, Miraflores de la Sierra, Madrid (invited speaker)
- Oct 2008** *First Steps in Managing People, Scientific Writing, Public Speaking* courses, Ispra, Italy
- Jun 2007** Biophotonics'07, 3rd International Graduate Summer School, Ven, Sweden
- Nov 2005** *Principles and Applications of Time-Resolved Fluorescence Spectroscopy* 3rd European short course, Berlin, Germany
- Jan 2005** IX School Of Pure and Applied Biophysics, Venice, Italy
- Jan 2002** *20th Course: Frontiers of Optical Spectroscopy*, Ettore Majorana Center, Erice, Sicily, Italy

#### ORGANISATION OF INTERNATIONAL CONFERENCES:

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- May 2018** Scientific committee of **2<sup>nd</sup>** Conference and Spring School on Properties, Design and Applications of Upconverting Nanomaterials (UPCON'18), Valencia, Spain
- June 2016** Scientific committee of Polish Scientific Networks 2016 Conference and chairman of Innovative technologies2x session
- June 2016** Co-Chairman of **2<sup>nd</sup>** International Conference "Current Trends in Cancer Theranostics" Druskininkai, Lithuania
- May 2016** Chairman and organizer of *1<sup>st</sup> Conference and Spring School on Properties, Design and Applications of Upconverting Nanomaterials (UPCON'16)*

- Aug 2014**      *International Conference on Luminescence (ICL, Wrocław, Poland, organizing committee*
- Sep 2005**      *International Conference on f-elements, Szklarska-Poreba, Poland, organizing committee*
- Jun 2004**      *International Symposium on New Trends in Photodynamic therapy and Diagnosis, Wrocław, Poland, symposium secretary*
- Jun 2003**      *Rare-earth systems, Ladek Zdrój, Poland, organizing committee*
- Jun 2001**      *Excited State of Transition Elements, Ladek Zdrój, Poland, organizing committee*

**SCIENTIFIC INTERESTS:**

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- Lasers and spectroscopy in medicine (hypespectral imaging, fluorescence lifetime imaging, photodynamic therapy, light dosimetry etc.
- Applications on nanocolloidal luminophores moped with lanthanide ions for bio-medical, bio-sensing and bio-imaging applications
- Cooperative energy transfer in (nano)cristals doped with lanthanides, photon avalanche, new materials doped with lanthanides for laser materials, microlasers, laser diode pumped solid state lasers

**NON-SCIENTIFIC INTERESTS:**

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- Music - a singer in Technical University Choir (1996 - 2000) and Medical University Choir (2000 - 2002), Wrocław
- Art photography, mountain trekking, sport (volleyball, tennis), tourism, history of science