

Name, surname, title: **RNDr. Kateřina Kůsová, Ph.D.**
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Publons: [D-8842-2011](#)

Education

2004–2009 PhD. study at the *Faculty of Mathematics and Physics*, Charles University (MFF UK), Prague
May 2007 RNDr. degree obtained at MFF UK
1999–2004 graduate studies at MFF UK

Research experience including carrier breaks

Jan 2021–present Deputy Head of the Department of Thin Films and Nanostructures at the *Institute of Physics, Czech Academy Sciences* (IoP CAS)
Sep 2019 start of full-time employment after maternity leaves as a *Group Leader of the Group of Laser Spectroscopy of Silicon-Based Nanomaterials*
Apr 2016–Apr 2018 second official maternity leave
Nov 2012–Oct 2014 first official maternity leave
2013–2019 Researcher position at IoP CAS
Dec 2009–Nov 2012 Postdoctoral Researcher at IoP CAS
Jun 2004–Dec 2009 Graduate Research Assistant at IoP CAS
Jan 2003–Jun 2004 Undergraduate Research Assistant at IoP CAS

Publication record

- *Author or co-author* of **4 book chapters** and **40 papers** (14 first author, 5 senior author¹) published in peer-reviewed impacted international journals (including *Green Chem*,¹ *Chem Mater*,² *ACS Nano*,⁷ *Light Sci & Appl*,³ etc.) with approx. **1068 WOS citations**, including **1 invited review article**⁵
- **2 patents**⁸
- **H-index: 17** (ISI), 18 (Google Scholar), Google Scholar i10 index 23

Awards

- the *Otto Wichterle* award of the CAS for exceptional young scientists, 2019
- *Award of the President of the Czech Science Foundation* 2016 for outstanding results in research project “Macroscopic and microscopic luminescence properties of silicon nanoparticles”
- *L’Oreal/UNESCO “For Women in Science”* Scholarship Czech Republic (2014)

Field of investigation

- Synthesis of nanoparticles in *non-thermal plasma* and *plasma-based surface modification*^{1,8}
- Mechanisms influencing *radiative rates* in silicon nanoparticles²
- Luminescence measurements as a tool for the study of *electronic states and relaxation mechanisms*
- *Single-nanocrystal photoluminescence spectroscopy*^{3,7} and blinking experiments
- Experimental and theoretical prove of *direct bandgap in silicon nanocrystals induced by tensile-strain-engineering* using surface capping^{4,6}

Supervision responsibilities

- a supervisor-specialist to a bachelor and master thesis (F. Matějka) (since Sep 2020)
- daily supervision of the work of a PhD student (T. Popelář) and a post-doctoral fellow (P. Galář) (since 2019)
- daily supervision of PhD students/postdoctoral fellows (O. Cibulka, E. Klimešová, 2009–2012)

Projects

- Czech Science Foundation project no. 23-05837S, 2023–2025, “*Phonon recycling in semiconductor quantum dots*”, the principal investigator

- Czech Science Foundation project no. [18-05552S](#), 2018–2021, “*From single silicon nanocrystals to optically and electrically efficient multilayers*,” the principal investigator
- Czech Ministry of Education, Youth and Sports OPVVV project SOLID21, 2018–2023, key team member
- Czech Science Foundation post-doc project no. [GPP204/12/P235](#), 2012–2015, “*Macroscopic and microscopic luminescence properties of silicon nanoparticles*”, the principal investigator, **awarded as excellent**

Invited contributions at important conferences and organization of scientific meetings

- *co-organizer of Symposium EL07: Group IV Nanostructures for Emerging Optoelectronic Applications of the international MRS conference* (San Francisco, USA, 10–14 April 2023)
- EOS Topical Meetings on Optical Microsystems, Anacapri, Italy, 9–11 Sep 2019
- E-MRS Spring Meeting, Strasbourg, France, 22–30 May 2017
- E-MRS Spring Meeting, Lille, France, 2–6 May 2016
- *co-organizer of Symposium P at the international E-MRS conference* (Warsaw, Poland, 2015)
- ICANS-24 conference in Nara, Japan, 21–26 August 2011

Reviewing activities

- *reviewer to* 50 papers in international impacted journals (including ACS Nano, Nanoscale, Adv Func Mater, Light Sci Appl, etc.), 1 doctoral, 3 diploma, 1 bachelor’s thesis
- Czech Science Foundation *panel member* (2021–2022, P204)
- *committee member* of the Student Scientific Conference of the VŠCHT, Prague (2019 and 2020)
- *scientific committee member* of Symposium I at the E-MRS Spring Meeting 2018

Other

- member of the Research Support Working Group, IoP CAS (2021)
- member of the election committee of the IoP, CAS (2012)
- participation on the translation of textbook *Luminescence Spectroscopy of Semiconductors* by I. Pelant and J. Valenta (ISBN: 978-0-19-958833-6, Oxford University Press, 2012) to English

Selected publications, book chapters and patent

- ¹ P. Galář, A. Fučíková, K. Newell, T. Popelář, I. Matulková, J. Valenta, V. Scholtz and **K. Kůsová**: ‘Non-Thermal Pulsed Plasma Activated Water: Easy and Cheap Way for Efficient Surface Modification of Semiconductor Nanoparticles,’ *Green Chem.* **2021**, 23 898–911, ([here](#)).
- ² K. Dohmalová, P. Hapala, **K. Kůsová** and I. Infante: ‘Electronic Structure Engineering Achieved via Organic Ligands in Silicon Nanocrystals,’ *Chem. Mater.* **2020**, 32(15) 6326–6337, ([here](#)).
- ³ **K. Kůsová**, I. Pelant and J. Valenta: ‘Bright trions in direct-bandgap silicon nanocrystals revealed by low-temperature single-nanocrystal spectroscopy,’ *Light Sci Appl* **2015**, 4 e336, ([here](#)).
- ⁴ **K. Kůsová**, P. Hapala, J. Valenta, P. Jelínek, O. Cibulka, L. Ondič and I. Pelant: ‘Direct Bandgap Silicon: Tensile-Strained Silicon Nanocrystals,’ *Adv. Mater. Interfaces* **2014**, 1(2) 1300042, ([here](#)).
- ⁵ K. Dohmalová, T. Gregorkiewicz and **K. Kůsová**: ‘Silicon quantum dots: surface matters,’ *J. Phys.:Condens. Matter.* **2014**, 26(17) 173201, ([here](#)).
- ⁶ P. Hapala, **K. Kůsová**, I. Pelant and P. Jelínek: ‘Theoretical analysis of electronic band structure of 2- to 3-nm Si nanocrystals,’ *Phys. Rev. B* **2013**, 87(19) 195420, ([here](#)).
- ⁷ **K. Kůsová**, O. Cibulka, K. Dohmalová, I. Pelant, J. Valenta, A. Fučíková, K. Žídek, J. Lang, J. English, P. Matějka, P. Štěpánek and S. Bakardjieva: ‘Brightly Luminescent Organically Capped Silicon Nanocrystals Fabricated at Room Temperature and Atmospheric Pressure,’ *ACS Nano* **2010**, 4(8) 4495–4504, ([here](#)).
- ⁸ P. Galář, J. Khun, **K. Kůsová** and A. Fučíková: “*A method for surface modification of semiconductor nanoparticles using non-thermal plasma activated water and product thereof*,” **patent granted 2021**: LU 101406, EPO patent application.

as of April 13, 2023