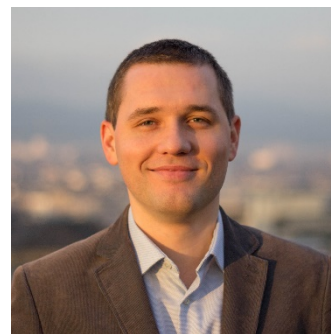


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## EMPLOYMENT

Swiss Federal Institute of Technology, ETH Zurich, Switzerland  
Senior Scientist (Oberassistent) and SNSF Ambizione Fellow (August 2016 – present)  
Postdoctoral Researcher (November 2013 – July 2016)  
Laboratory for Nanoelectronics, Department of Information Technology and Electrical Engineering  
Advisor: Professor Vanessa C. Wood

EMPA – Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland  
Marie-Curie Postdoctoral Fellow (March 2012 – October 2013)  
Functional Inorganic Materials, Laboratory for Thin Films and Photovoltaics  
Advisor: Professor Maksym V. Kovalenko

## EDUCATION

Johannes Kepler University Linz, Austria  
Ph.D. in Nanoscience and Nanotechnology (February 2012; honors)  
Advisor: Professor Wolfgang Heiss

Visiting Student at the University of Chicago, USA (September-October 2008)  
Department of Chemistry  
Advisor: Professor Dmitri V. Talapin

Ivan Franko National University of Lviv, Ukraine  
M.Sc. in Inorganic Chemistry (July 2007; honors)  
B.Sc. in Chemistry (June 2006; honors)

Visiting Student at the Technical University of Munich, TUM, Germany (January-February 2007)  
Department of Chemistry  
Advisor: Professor Thomas F. Fässler

## AWARDS

### Funding

Feb. 2018 Innovedum Grant (Innovative Education at ETH Zurich), 60000 CHF  
May 2017 QSIT Knowledge and Technology Transfer Grant (NCCR Quantum Sci. Techn.), 80000 CHF  
Aug. 2016 SNSF Ambizione Fellowship, 455000 CHF  
Mar. 2012 Marie Curie EMPA Postdocs Grant, ~200000 CHF  
Sep. 2006 DAAD Leonhard Euler Scholarship, ~2000 EUR and 1 month research stay in TUM

### Honors

Apr. 2018 Best Talk Award (at the 2018 MRS Spring Meeting, Symposium NM12)  
Jul. 2017 ACS Nano Best Poster Award (at the NaNaX8 – Nanoscience with Nanocrystals)  
Mar. 2016 Spark Award Finalist 2016 (top-5 patent of ETH Zurich, filed in 2015)  
Sep. 2014 QSIT q-starter Award (best business idea in NCCR Quantum Science and Technology)  
Jan. 2014 Logo contest winner, ScopeM, ETH Zurich  
May 2006 Undergraduate Student Award

## TEACHING RESPONSIBILITIES

### Individual Teaching Activities (*lead in course development and implementation*)

- Since 2019 “Chemistry of Electronic Devices”, lecture and laboratory course for electrical engineering students, bachelor level (with support of an ETH Innovedum Grant)
- 2016 – present “Phase Change Materials for Next Generation Transistor Free Memories”, lecture and laboratory block-course, bachelor level
- 2016 “Workshop on crystal structure visualization”, bachelor level

### Contributions to Teaching Activities (*support of existing courses*)

- 2015 – present guest lecture “Synthesis of materials for optoelectronic applications” for “Organic and Nanostructured Optics and Electronics”, master level
- 2014 – present laboratory course leader for “Organic and Nanostructured Optics and Electronics”, master level
- 2013 – present guest lecture “Quasicrystals” for “Functional Inorganics”, master level

### Mentoring

- 2013 – present supervised 6 master and 7 bachelor students (all of them are staying in academia as master or PhD students in ETH Zurich, Oxford, Yale, University of Zurich, and PSI)
- Two of these master projects resulted in first-author publications for the students  
A. Moser et al., *The Journal of Physical Chemistry C*, **2017**, *121*, 24345  
P. Benedek et al., *RSC Advances*, **2017**, *7*, 17763

## INVITED TALKS

- June 2018 RWTH Aachen, Germany, host: Prof. Matthias Wuttig
- May 2018 Friedrich-Alexander Universität Erlangen-Nürnberg, Germany, host: Prof. Wolfgang Heiss
- Sep. 2017 Technische Universität Dresden, Germany, host: Prof. Alexander Eychmüller
- Dec. 2014 Montanuniversität Leoben, Austria, host: Prof. Rainer T. Lechner
- Sep. 2012 Ivan Franko National University of Lviv, Ukraine, host: Prof. Roman E. Gladyshevskii

## CONFERENCE CONTRIBUTIONS

### First-author and PI contributions

10 talks & 8 posters (MRS Spring 2015 & 2018, EMRS Spring 2017, NaNaX 2010, 2014 & 2017, Quantum Dot 2010, GÖCH 2017, SCS 2016 & 2017, etc.)

Attendee of the 63<sup>rd</sup> Lindau Nobel Laureate Meeting, Chemistry, 2013 (competitive selection basis)

## PROFESSIONAL SERVICE

- Co-chair of nanoGe Fall Meeting 2019 “Charge Carrier Dynamics”
- Guest Editor for *Frontiers in Chemistry* (Research Topic “Colloidal Semiconductor Nanocrystals: Synthesis, Properties, and Applications”)
- Reviewer for *Chem. Mater.*, *J. Phys. Chem. Lett.*, *Inorg. Chem.*, *Nanoscale*, *J. Mater. Chem. C*, etc.
- Principal Investigator for SNSF Ambizione Project
- Beamtime applications and measurements (SLS Villigen, ESRF Grenoble)
- Member of American Chemical Society, Swiss Chemical Society, Marie Curie Alumni Association

## PERSONAL

- Born October 27, 1985 in Chervonograd, Ukraine
- Married, 2 children
- Hobbies: music, scientific data visualization

## FULL LIST OF PUBLICATIONS

42 publications, including 2 review papers and 1 patent application

H-factor 20 (Google Scholar, June 6, 2018)

Loop: 334663; ORCID: 0000-0002-2006-2466; ResearcherID: A-2851-2015

### Reviews

42. O. Yarema, **M. Yarema**, and V. Wood, Tuning the Composition of Multicomponent Semiconductor Nanocrystals: The Case of I-III-VI Materials. *Chemistry of Materials* **2018**, *30*, 1446-1461

41. **M. Yarema**, R. Caputo, and M.V. Kovalenko, Precision Synthesis of Colloidal Inorganic Nanocrystals Using Metal and Metalloid Amides. *Nanoscale* **2013**, *5*, 8398-8410

### Research Articles

40. M. Burian, C. Karner, **M. Yarema**, W. Heiss, H. Amenitsch, C. Dellago, and R.T. Lechner, Shape Induced Orientation Phase within 3D Nanocrystal Solids. *Advanced Materials* **2018** (*accepted*)

39. N. Yazdani, T. Nguyen-Thanh, **M. Yarema**, W.M.M. Lin, R. Gao, O. Yarema, A. Bosak, and V. Wood, Measuring the Vibrational Density of States of Nanocrystal-Based Thin Films with Inelastic X-Ray Scattering. *The Journal of Physical Chemistry Letters* **2018**, *9*, 1561-1567

38. S. Volk, N. Yazdani, E. Sanusoglu, O. Yarema, **M. Yarema**, and V. Wood, Measuring the Electronic Structure of Nanocrystal Thin Films Using Energy-Resolved Electrochemical Impedance Spectroscopy. *The Journal of Physical Chemistry Letters* **2018**, *9*, 1384-1392

37. **M. Yarema**, Y. Xing, R.T. Lechner, L. Ludescher, N. Dordevic, W.M.M. Lin, O. Yarema, and V. Wood, Mapping the Atomistic Structure of Graded Core/Shell Colloidal Nanocrystals. *Scientific Reports* **2017**, *7*, 11718

36. **M. Yarema**, O. Yarema, W.M.M. Lin, S. Volk, N. Yazdani, D. Bozyigit, V. Wood, Upscaling Colloidal Nanocrystal Hot-Injection Syntheses via Reactor Underpressure. *Chemistry of Materials* **2017**, *29*, 796-803

35. A. Moser, **M. Yarema**, W.M.M. Lin, O. Yarema, N. Yazdani, and V. Wood, In Situ Monitoring of Cation-Exchange Reaction Shell Growth on Nanocrystals. *The Journal of Physical Chemistry C* **2017**, *121*, 24345-24351

34. P. Benedek, N. Wenzler, **M. Yarema**, and V. Wood, Low Temperature Hydrothermal Synthesis of Battery-Grade Lithium Iron Phosphate. *RSC Advances* **2017**, *7*, 17763-17767

33. O. Yarema, **M. Yarema**, W.M.M. Lin, and V. Wood, Cu-In-Te and Ag-In-Te Colloidal Nanocrystals with Tunable Composition and Size. *Chemical Communications* **2016**, *52*, 10878-10881

32. D. Kriegner, M. Sytnyk, H. Groiss, **M. Yarema**, W. Grafeneder, P. Walter, A.-C. Dippel, M. Meffert, D. Gerthsen, J. Stangl, and W. Heiss, Galvanic Exchange in Colloidal Metal/Metal-Oxide Core/Shell Nanocrystals. *The Journal of Physical Chemistry C* **2016**, *120*, 19848-19855

31. D. Bozyigit, N. Yazdani, **M. Yarema**, O. Yarema, W.M.M. Lin, S. Volk, K. Vuttivorakulchai, M. Luisier, F. Juranyi, and V. Wood, Soft Surfaces of Nanomaterials Enable Strong Phonon Interactions. *Nature* **2016**, *531*, 618-622

30. O. Yarema, **M. Yarema**, D. Bozyigit, W.M.M. Lin, V. Wood, Independent Composition and Size Control for Highly Luminescent Indium-Rich Silver Indium Selenide Nanocrystals. *ACS Nano* **2015**, *9*, 11134-11142

29. R.T. Lechner, G. Fritz-Popovski, **M. Yarema**, W. Heiss, A. Hoell, T.U. Schüllli, D. Primetzhofer, M. Eibelhuber, and O. Paris, Crystal Phase Transitions in the Shell of PbS/CdS Core/Shell Nanocrystals Influences Photoluminescence Intensity. *Chemistry of Materials* **2014**, *26*, 5914-5922

28. **M. Yarema**, M. Wörle, M.D. Rossell, R. Erni, R. Caputo, L. Protesescu, K.V. Kravchyk, D.N. Dirin, K. Lienau, F. von Rohr, A. Schilling, M. Nachttegaal, and M.V. Kovalenko, Monodisperse Colloidal Gallium Nanoparticles: Synthesis, Low Temperature Crystallization, Surface Plasmon Resonance and Li-Ion Storage. *Journal of the American Chemical Society* **2014**, *136*, 12422-12430

27. S.Z. Bisri, E. Degoli, N. Spallanzani, G. Krishnan, B.J. Kooi, C. Ghica, **M. Yarema**, W. Heiss, O. Pulci, S. Ossicini, and M.A. Loi, Determination of the Electronic Energy Levels of Colloidal Nanocrystals using Field-Effect Transistors and Ab-Initio Calculations. *Advanced Materials* **2014**, *26*, 5639-5645
26. N. Yazdani, D. Bozyigit, O. Yarema, **M. Yarema**, and V. Wood, Hole Mobility in Nanocrystal Solids as a Function of Constituent Nanocrystal Size. *The Journal of Physical Chemistry Letters* **2014**, *5*, 3522-3527
25. G. Itskos, P. Papagiorgis, D. Tsokkou, A. Othonos, F. Hermerschmidt, S.P. Economopoulos, **M. Yarema**, W. Heiss, and S. Choulis, Size-Dependent Charge Transfer in Blends of PbS Quantum Dots with a Low-Gap Silicon-Bridged Copolymer. *Advanced Energy Materials* **2013**, *3*, 1490-1499
24. O. Yarema, D. Bozyigit, I. Rousseau, L. Nowack, **M. Yarema**, W. Heiss, and V. Wood, Highly Luminescent, Size- and Shape-Tunable Copper Indium Selenide Based Colloidal Nanocrystals. *Chemistry of Materials* **2013**, *25*, 3753-3757
23. **M. Yarema** and M.V. Kovalenko, Colloidal Synthesis of InSb Nanocrystals with Controlled Polymorphism Using Indium and Antimony Amides. *Chemistry of Materials* **2013**, *25*, 1788-1792
22. S.Z. Bisri, C. Piliago, **M. Yarema**, W. Heiss, and M.A. Loi, Low Driving Voltage and High Mobility Ambipolar Field-Effect Transistors with PbS Colloidal Nanocrystals. *Advanced Materials* **2013**, *25*, 4309-4314
21. D. Tsokkou, G. Itskos, S. Choulis, **M. Yarema**, W. Heiss, and A. Othonos, Concentration and Excitation Effects on the Exciton Dynamics of Poly(3-hexylthiophene)/PbS Quantum Dot Blend Films. *Nanotechnology* **2013**, *24*, 235707
20. K. Kravchyk, L. Protesescu, M.I. Bodnarchuk, F. Krumeich, **M. Yarema**, M. Walter, C. Guntlin, and M.V. Kovalenko, Monodisperse and Inorganically Capped Sn and Sn/SnO<sub>2</sub> Nanocrystals for High-Performance Li-Ion Battery Anodes. *Journal of the American Chemical Society* **2013**, *135*, 4199-4202
19. C. Piliago, M. Manca, R. Kroon, **M. Yarema**, K. Szendrei, M. R. Andersson, W. Heiss, and M. A. Loi, Charge Separation Dynamics in a Narrow Band Gap Polymer–PbS Nanocrystal Blend for Efficient Hybrid Solar Cells. *Journal of Materials Chemistry* **2012**, *22*, 24411-24416
18. **M. Yarema**, S. Pichler, D. Kriegner, J. Stangl, O. Yarema, R. Kirchschrager, S. Tollabimazraehno, M. Humer, D. Häring, M. Kohl, G. Chen, and W. Heiss, From Highly Monodisperse Indium and Indium Tin Colloidal Nanocrystals to Self-Assembled Indium Tin Oxide Nanoelectrodes. *ACS Nano* **2012**, *6*, 4113-4121
17. K. Szendrei, M. Speirs, W. Gomulya, D. Jarzab, M. Manca, O. V. Mikhnenko, **M. Yarema**, B.J. Kooi, W. Heiss, and M.A. Loi, Exploring the Origin of the Temperature-Dependent Behavior of PbS Nanocrystal Thin Films and Solar Cells. *Advanced Functional Materials* **2012**, *22*, 1598-1605
16. **M. Yarema**, O. Zaremba, R. Gladyshevskii, V. Hlukhyy, and T.F. Fässler, R<sub>4</sub>Ir<sub>13</sub>Ge<sub>9</sub> (R = La, Ce, Pr, Nd, Sm) and RIr<sub>3</sub>Ge<sub>2</sub> (R = La, Ce, Pr, Nd): Crystal Structures with Nets of Ir Atoms. *Journal of Solid State Chemistry* **2012**, *196*, 72-78
15. M. Madl, W. Brezna, B. Basnar, **M. Yarema**, W. Heiss, and J. Smoliner, Variable Wavelength Photocurrent Mapping on PbS Quantum Dot: Fullerene Thin Films by Conductive Atomic Force Microscopy. *Semiconductor Science and Technology* **2011**, *26*, 095002
14. D. Jarzab, K. Szendrei, **M. Yarema**, S. Pichler, W. Heiss, and M.A. Loi, Charge-Separation Dynamics in Inorganic-Organic Ternary Blends for Efficient Infrared Photodiodes. *Advanced Functional Materials* **2011**, *21*, 1988-1992
13. **M. Yarema**, S. Pichler, M. Sytnyk, R. Seyrkammer, R.T. Lechner, G. Fritz-Popovski, D. Jarzab, K. Szendrei, R. Resel, O. Korovyanko, M.A. Loi, O. Paris, G. Hesser, and W. Heiss, Infrared Emitting and Photoconducting Colloidal Silver Chalcogenide Nanocrystal Quantum Dots from a Silylamide-Promoted Synthesis. *ACS Nano* **2011**, *5*, 3758-3765
12. S. Pichler, M.I. Bodnarchuk, M.V. Kovalenko, **M. Yarema**, G. Springholz, D.V. Talapin, and W. Heiss, Evaluation of Ordering in Single-Component and Binary Nanocrystal Superlattices by Analysis of Their Autocorrelation Functions. *ACS Nano* **2011**, *5*, 1703-1712
11. I. Humer, O. Bethge, M. Bodnarchuk, M. Kovalenko, **M. Yarema**, W. Heiss, H.P. Huber, M. Hochleitner, P. Hinterdorfer, F. Kienberger, and J. Smoliner, Scanning Microwave Microscopy and Scanning Capacitance Microscopy on Colloidal Nanocrystals. *Journal of Applied Physics* **2011**, *109*, 064313

10. M. Madl, W. Brezna, G. Strasser, P. Klang, A.M. Andrews, M.I. Bodnarchuk, M.V. Kovalenko, **M. Yarema**, W. Heiss, and J. Smoliner, AFM-Based Photocurrent Imaging of Epitaxial and Colloidal Quantum Dots. *Physica Status Solidi C* **2011**, *8*, 426-428
9. **M. Yarema**, M.V. Kovalenko, G. Hesser, D.V. Talapin, and W. Heiss, Highly Monodisperse Bismuth Nanoparticles and Their Three-Dimensional Superlattices. *Journal of the American Chemical Society* **2010**, *132*, 15158-15159
8. K. Szendrei, W. Gomulya, **M. Yarema**, W. Heiss, and M.A. Loi, PbS Nanocrystal Solar Cells with High Efficiency and Fill Factor. *Applied Physics Letters* **2010**, *97*, 203501
7. K. Szendrei, D. Jarzab, **M. Yarema**, M. Sytnyk, S. Pichler, J.C. Hummelen, W. Heiss, and M.A. Loi, Surface Modification of Semiconductor Nanocrystals by a Methanofullerene Carboxylic Acid. *Journal of Materials Chemistry* **2010**, *20*, 8470-8473
6. A. Gocalinska, M. Saba, F. Quochi, M. Marceddu, K. Szendrei, J. Gao, M.A. Loi, **M. Yarema**, R. Seyrkammer, W. Heiss, A. Mura, and G. Bongiovanni, Size-Dependent Electron Transfer from Colloidal PbS Nanocrystals to Fullerene. *The Journal of Physical Chemistry Letters* **2010**, *1*, 1149-1154
5. K. Szendrei, F. Cordella, M.V. Kovalenko, M. Böberl, G. Hesser, **M. Yarema**, D. Jarzab, O.V. Mikhnenko, A. Gocalinska, M. Saba, F. Quochi, A. Mura, G. Bongiovanni, P.W.M. Blom, W. Heiss, and M.A. Loi, Solution-Processable Near-IR Photodetectors Based on Electron Transfer from PbS Nanocrystals to Fullerene Derivatives. *Advanced Materials* **2009**, *21*, 683-687

### Peer-reviewed conference proceedings

4. D. Haringer, G. Chen, P. Jakobs, **M. Yarema**, W. Heiss, and M. Kohl, High Precision Positioning of Plasmonic Nanoparticle Based on Damascene Process. *IEEE-NANO* **2012**, 1-4
3. M. Madl, W. Brezna, P. Klang, A. M. Andrews, G. Strasser, M.I. Bodnarchuk, M.V. Kovalenko, **M. Yarema**, W. Heiss, and J. Smoliner, Mapping the Local Photoresponse of Epitaxial and Colloidal Quantum Dots by Photoconductive Atomic Force Microscopy. *AIP Conference Proceedings* **2011**, *1399*, 1073-1074
2. I. Humer, J. Smoliner, O. Bethge, C. Eckhardt, M. Bodnarchuk, M. Kovalenko, **M. Yarema**, and W. Heiss, Quasistatic Dielectric Constants Of Colloidal Nanocrystals. *AIP Conference Proceedings* **2011**, *1399*, 1053-1054

### Patent application

1. **M. Yarema**, O. Yarema, and V. Wood, Luminescent Semiconductor Nanocrystals and Methods for Making Same (*EP3162874A1*, filed on **2.11.2015**)

### Covers

