Curriculum Vitae – Ilia A. Solov'yov, Ph.D.

Personal Data

Date and place of birth: November 10, 1983; Leningrad (St. Petersburg), USSR (Russia)
Civil status: Married to Vita Solovyeva
Children: Vladimir Ilya Solovyev (born October 17, 2012)
Valery Ilya Solovyev (born July 30, 2015)

Contact Information

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Carl von Ossietzky Universität Oldenburg
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Research Interests

I have a strong background in **theoretical** and **computational physics**, as well as **biophysics**. My research interests cover a broad range of questions on theory of biomolecules and smart inorganic materials. Of particular interest are those biological processes that trigger energy conversion into forms that are usable for chemical transformations and are quantum mechanical in nature. Such processes involve chemical reactions, light absorption, formation of excited electronic states, transfer of excitation energy, and transfer of electrons and protons in chemical processes. Equally intriguing are problems in nanophysics which focus on potential applications in nano- technology, material science and medicine. I employ various levels of theory, including classical and quantum molecular dynamics, Monte-Carlo, coarse grained methods and multiscale techniques; often it is crucial to go beyond the standard methodologies, in which case specialized methods and tools are being designed and developed in my group. Many of the simulations require high performance computing facilities, and throughout the years I have gained significant experience working with supercomputers and utilizing them for addressing problems of interest.

Work Experience

Carl von Ossietzky Universität Oldenburg
Department of Physics, Oldenburg, Germany
Professor — **October 2019 – present**

University of Southern Denmark
Department of Physics, Chemistry and Pharmacy, Faculty of Science, Odense, Denmark
Associate Professor — **July 2014 – 2019**
Assistant Professor — **October 2013 – June 2014**

Paternity leave — **2015 – 2016**
2012 – 2013

University of Illinois at Urbana-Champaign
Beckman Institute for Advanced Science and Technology, Urbana, Illinois, USA
Beckman Postdoctoral Fellow — **2010 – 2013**

Johann-Wolfgang Goethe University
Frankfurt Institute for Advanced Studies, Frankfurt am Main, Germany
Postdoctoral Research Fellow — **2008 – 2010**

University of Illinois at Urbana-Champaign
Beckman Institute for Advanced Science and Technology, Urbana, Illinois, USA
Visiting scholar, one-month visits — **2006, 2008 – 2010**

Johann-Wolfgang Goethe University
Frankfurt International Graduate School for Science at the Frankfurt Institute for Ad-

vanced Studies, Frankfurt am Main, Germany
Graduate Researcher **2005 – 2008**

Education

A.F. Ioffe Physical-Technical Institute, Russian Academy of Sciences
St. Petersburg, Russia **2009**
Candidate of Sciences in Theoretical Physics (equivalent to Ph.D.)
Dissertation title: New approaches for the description of nanoscale systems on the example of atomic clusters, carbon nanotubes and fullerene-based nanowires
Advisor: Prof. Dr. Oleg V. Konstantinov

Johann Wolfgang Goethe University, Frankfurt am Main, Germany **2008**
Ph.D. in Physics with Honors (summa cum laude)
Dissertation title: Magnetoreception mechanisms in birds – towards the discovery of the sixth sense
Advisor: Prof. Dr. h. c. mult. Walter Greiner

St. Petersburg State Polytechnical University, St. Petersburg, Russia **2006**
Master of Sciences in Physics with Honors
Thesis title: Structure and properties of metallic and noble gas clusters

Johann Wolfgang Goethe University Frankfurt am Main, Germany **2004**
Diploma in Physics with Honors
Thesis title: Ab initio and model description of atomic clusters

St. Petersburg State Polytechnical University St. Petersburg, Russia **2004**
Bachelor of Sciences in Physics with Honors
Thesis title: Modeling of Lennard-Jones clusters

Lyceum "Physical-Technical High School", Russian Academy of Sciences
St.Petersburg, Russia **2000**

Elm-Wood School, London, United Kingdom **1995**

Jacob Bruce Gymnasium №192, St. Petersburg, Russia **1990 – 1998**

Elsa-Brandström School, Frankfurt am Main, Germany **1990 – 1992**

Grants, Honors and Awards

Bundesamt für Strahlenschutz **2023**
Research grant "Is radical-pair mechanism relevant for radiation protection?" (€ 464,000)

German Research Foundation (DFG) **2023-2027**
Hyperpolarisation in molekularen Systemen, SFB/Transregio 386: HYP*MOL, Germany
PI: Jörg Matysik. (€ 13,095,000)
Co-applicant, my part: (€ 193,000)

German Research Foundation (DFG) **2023-2026**
Magnetoreception and Navigation in Vertebrates, CRC 1372(2), Germany
PI: Henrik Mouritsen. (€ 11,401,000)
Co-applicant, my part: (€ 565,532)

Ministry for Science and Culture of Lower Saxony **2022**
Collaborative Research grant "Dynamics in Nanostructures (DyNano)", Germany
PI: Christoph Lienau. (€ 2,500,000)
Co-applicant, my part: (€ 200,000)

Scientific Council of the NHR centers NHR@ZIB and NHR@Göttingen 2023

High performance computing grant (Core-hours 16,405,000)

European Cooperation in Science and Technology (COST) **2021**
COST Action CA20129: Multiscale Irradiation and Chemistry Driven Processes and Related Technologies
Working Group Leader, Management Committee member (Germany)

Norddeutscher Verbund für Hoch- und Höchstleistungsrechnen (HLRN) **2022**
High performance computing grant (NPL 1,200,000 eqv. €312,000)

Norddeutscher Verbund für Hoch- und Höchstleistungsrechnen (HLRN) **2021**
High performance computing grant (NPL 910,000 eqv. €241,800)

Universitätsgeselschaft Oldenburg e.V. (UGO) **2020**
University society Oldenburg
Award for excellent research, Oldenburg, Germany. (€5,000)

Ministry for Science and Culture of Lower Saxony **2020**
Collaborative Research grant "Simulations meet experiments on the nanoscale: opening up the quantum world to artificial intelligence (SMART)", Germany
PI: Caterina Cocchi. (€978,662)
Co-applicant, my part: (€247,000)

German Research Foundation (DFG) **2020-2022**
Magnetoreception and Navigation in Vertebrates, CRC 1372, Germany
PI: Henrik Mouritsen. (€8,596,000)
Co-applicant, my part: (€460,000)

German Research Foundation (DFG) **2019**
Research Training group, "Molecular Basis of Sensory Biology", GRK1885, Germany
PI: Karl-Wilhelm Koch. (€7,571,000)
Co-applicant, my part: (€222,000)

Volkswagenstiftung **2019**
Lichtenberg Professorship, Germany. (€1,322,600)

Danish council for independent research **2018**
Research grant, Denmark. (DKK 2,592,000)

Danish council for independent research **2017**
Research grant, Denmark
Co-applicant. PI: Jakob Kongsted. (DKK 7,813,002)

Danish e-Infrastructure Cooperation (DeIC) **2017**
High performance computing grant (node/hrs 462,810 eqv. DKK 976,839)

Danish Ministry of Education **2017**
Travel grant for a supervised student, Denmark
student: Emil Sjulstok Rasmussen (DKK 200,000)

Danish e-Infrastructure Cooperation (DeIC) **2016**
High performance computing grant (node/hrs 410,778 eqv. DKK 890,430)

SDU e-Science Centre **2015**
Ph.D. scholarship grant (1/3), Odense, Denmark
Co-applicant. PI: Himanshu Khandelia. (DKK 500,000)

Danish e-Infrastructure Cooperation (DeIC) **2015**
High performance computing grant (node/hrs 284,812 eqv. DKK 627,393)

The Alfred Benzon Foundation **2015**
Workshop organization grant, Copenhagen, Denmark. (DKK 49,420)

Lundbeck Foundation Young Investigator Grant **2014**
5 year individual research fellowship, Copenhagen, Denmark. (DKK 10,000,000)

The Extreme Science and Engineering Discovery Environment (XSEDE) **2014**
Supercomputer time allocation grant, USA
Co-applicant. PI: David LeBard. ($ 114,485)

Danish e-Infrastructure Cooperation (DeIC) **2013**
High performance computing grant
Co-applicant. PI: Hans Jørgen Aagaard Jensen. (DKK 792,000)

Beckman conference challenge proposal **2013**
Symposium organization grant
Co-applicant with Baoxing Xu. ($ 10,000)

Arnold and Mabel Beckman Foundation **2010 – 2013**
Beckman institute postdoctoral fellowship, Urbana, USA. ($ 156,000)

Stiftung Polytechnische Gesellschaft **2008 – 2010**
The foundation "Stiftung Polytechnische Gesellschaft"
Research fellowship, Frankfurt am Main, Germany. (€ 102,000)

Frankfurter Förderverein für physikalische Grundlagenforschung **2008**
Frankfurt foundation for fundamental physical sciences
One of a kind award for interdisciplinary research on magnetoreception in birds and other animals, Frankfurt am Main, Germany. (€ 10,000)

Philipp Siedler-Wissenschaftspreis **2006**
Philipp Siedler science award
The best Diploma thesis award, Frankfurt am Main, Germany. (€ 1,000)

Studienstiftung des deutschen Volkes **2003 – 2004**
Scholarship of the German nation
Educational foundation, fellowship, Germany

Soros foundation (ISSEP) award **2003, 2004**
Laureate of the *Student of the Year* contest, St. Petersburg, Russia

Teaching experience (Courses)

Department of Physics, Oldenburg, Germany
Lecturer: Introduction into Theoretical Physics, ∼40 students, (15 ECTS). **2023 –**
Lecturer: Thermodynamics and Statistical Physics, ∼35 students, (10 ECTS). **2022 –**
Lecturer: Advanced Quantum Mechanics, ∼15 students, (5 ECTS). **2020 –**
Lecturer: Multiscale Modelling of Molecular Systems, ∼15 students, (2 ECTS). **2020**
Lecturer: Introductory Quantum Mechanics, ∼35 students, (10 ECTS). **2020 –**
Lecturer: Computational Biophysics, ∼20 students, (5 ECTS). **2020 –**

University of Southern Denmark
Department of Physics, Chemistry and Pharmacy, Faculty of Science, Odense, Denmark
Lecturer: Introductory Astronomy, ∼10 students, (10 ECTS). **2019**
Lecturer: Computational Physics, ∼20 students, (5 ECTS). **2017 – 2019**

Lecturer: Introductory Quantum Mechanics, ∼25 students, (10 ECTS). **2015 – 2019**
Lecturer: Molecular Spectroscopy, ∼30 students, (5 ECTS). **2014 – 2015**

MBN Research Center
Crowne Plaza, Edinburgh, United Kingdom
Co-organizer and tutor: Training course on computational methods for complex molecular systems **May 17 – 19, 2014**

Goethe University
Frankfurt Institute for Advanced Studies, Frankfurt am Main, Germany
Visiting Lecturer: Multi-center molecular systems, course for graduate and post-graduate researchers **2011**
Tutorial development: Computational methods in Meso-Bio-Nano Science **2004 – 2010**

Johann-Wolfgang Goethe University
Institute for Theoretical Physics, Frankfurt am Main, Germany
Teaching Assistant: theoretical physics courses in statistical mechanics, thermodynamics, and basics of quantum mechanics. **2003 – 2004**

Supervision

With ongoing, **19** Bachelor students; **15** Masters students; **14** Ph.D. students; **13** Post-doctoral research associate; **4** Software developers;

Summary of Publications

187 peer reviewed scientific publications since 2002 including 149 journal publications, 20 book chapters, 6 refereed conference proceedings, 5 theses, 7 monographs/books; designed and contributed to **26** journal and book covers.
h-index of **34** with +5000 citations.
URL: http://scholar.google.com/citations?user=dKpz7QkAAAAJ&hl=en

Professional Service

Management Experience
Department of Physics, Oldenburg, Germany
Responsible for the physics bachelor's degree program **2021 –**

University of Southern Denmark, Department of Physics, Chemistry and Pharmacy
Faculty of Science, eScience committee member **2018 – 2019**
Member of the departmental council **2016 – 2019**

Conference and Symposia Organization
International Conference "Dynamics of Systems on the Nanoscale" (DySoN)
Member of the international advisory committee **since 2018**

Fifth International Conference "Dynamics of Systems on the Nanoscale" (DySoN 2018)
Potsdam, Germany, October 8 – 12, 2018
Symposium co-chair **2018**

Oxford-Oldenburg-Odense (O3) annual symposium on magnetoreception
Middelfart, Denmark, March 15 – 17, 2018
Middelfart, Denmark, September 08 – 10, 2016
Odense, Denmark, June 17 – 18, 2015
Symposium chair **2015 – 2018**

"Hands-on" Workshop on Computational Biophysics

Odense, Denmark, October 12 – 16, 2015
Co-organizer **2015**

Symposium: "The Radical-Pair Mechanism as Magnetoreceptor Mechanism" at the 16th International Congress on Photobiology
Córdoba, Argentina, September 09, 2014
Symposium co-chair **2014**

Interdisciplinary Symposium on Advanced Nano/Biosystems: Design, Fabrication, and Characterization
Urbana, Illinois, USA, September 25 – 27, 2013
Symposium co-chair **2013**

International Conference "Dynamics of Systems on the Nanoscale" (DySoN 2010)
National Research Council, Rome, Italy, November 16 – 19, 2010
Member of the local organizing committee **2010**

International Symposium on atomic cluster collisions: structure and dynamics from the nuclear to the biological scale (ISACC)
Ann Arbor, Michigan, USA, July 14 – 18, 2009
St. Petersburg, Russia, June 3 – 7, 2008, Europhysics Conference
GSI, Darmstadt, Germany, July 19 – 23 2007, Europhysics Conference
Member of the local organizing committee **2007 – 2009**

Professional Affiliations
Theoretical Section of the Danish Chemical Society
Member **2017 – 2019**

American Chemical Society
Member **2017**

MBN Research gGmbH (www.mbnresearch.com)
share holder and co-founder **2016 – present**

PerpeVit ApS (www.perpevit.com)
share holder and co-founder **2019 – present**

SDU eScience Centre (escience.dias.sdu.dk)
Affiliated member **2014 – present**
Faculty of Science, eScience committee member **2018 – present**

Physicalisches Verein, Frankfurt am Main, Germany
Member **2006 – 2010**

Summary of Presentations

144 presentations since 2003 including 80 invited presentations total (conferences, symposia, colloquia) and 5 invited general audience presentations.

Recent Representative Invited Talks (last 4 years)

Multiscale modelling of cryptochromes through VIKING
DFG Roundtable Discussion on Photoreceptors
Castle Ringberg, Germany **October 4, 2019**

Studying cryptochromes with the computational microscope
Colloquium at the Southwestern Medical Center
Dallas, Texas, USA **May 21, 2018**

Magnetic Compass Sense of Migratory Birds: A Perspective
Klaus Schulten Memorial Symposium
Urbana, Illinois, USA **November 09, 2017**

Introducing VIKING – the next generation virtual laboratory
Colloquium at the Department of Physics of University of Trento
Trento, Italy **April 26, 2017**

Computational and theoretical insights into vibrationally assisted electron transfer mechanism of olfaction
Molecular Recognition and the Chemical Senses
Telluride, Colorado, USA **July 19, 2016**

Quantum biology of the avian magnetic compass
Departamental Colloquium, University of Liverpool
Liverpul, United Kingdom **January 27, 2016**

Peer-review activities

Referee for 30 international journals
Applied Spectroscopy, Bioelectromagnetics, Biological Reviews, Biology Bulletin Reviews, Biophysical Journal, Biosensors, Carbon, Computational and Structural Biotechnology Journal, European Biophysics Journal, European Physical Journal D, Integrative Biology, Journal of Biophysics, Journal of Chemical Physics, Journal of Chemical Theory and Computation, Journal of Computational Chemistry, Journal of Nanotechnology, Journal of Physical Chemistry, Journal of Physical Chemistry Letters, Journal of the American Chemical Society, Journal of Theoretical Biology, Journal of the Royal Society Interface, Nature Chemistry, Nature Materials, Nature Scientific Reports, Naturwissenshaften, Philosophical Transactions A, Physical Review E, Physical Review Letters, PLoS One, Proceedings of the National Academy of Sciences of the United States of America

Editorial activities
The European Physical Journal D, topical issue on "Dynamics of Systems on the Nanoscale"
Guest Editor: **2018 – 2020**

Scientific Reports (Nature Publishing Group)
Academic Editor: **2017 – present**

Plos One (Public Library of Science)
Academic Editor: **2014 – present**

Journal of Nanotechnology (Hindawi Publishing Corporation), special Issue on "Fullerene-related nanocarbons and their applications"
Guest Editor: **2011**

Major Collaborations

Marcus Elstner	Karlsruhe Institute of Technology, Germany
David Estrada	Boise State University, Idaho, USA
Peter Hore	Oxford University, UK
Ron Hui	Hong Kong University, China
Daniel Kattnig	Exeter University, UK
Himanshu Khandelia	University of Southern Denmark (SDU), Odense, Denmark
Karl-Wilhelm Koch	Oldenburg University, Germany
Jacob Kongsted	University of Southern Denmark (SDU), Odense, Denmark
Wing-Yee Lui	Hong Kong University, China
Henrik Mouritsen	Oldenburg University, Germany
Andrey Solov'yov	MBN Research Centre, Germany

	Joseph Takahashi	Texas University, USA
Languages	Russian (native), English (professional), German (C1), and Danish (B2)	