

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

CONTACT INFORMATION Department of Physics, Chemistry and Pharmacy Phone: +45-6550-2532
University of Southern Denmark Fax: +45-6615-8780
Campusvej 55, 5230 Odense M, E-mail: ilia@sdu.dk
Denmark Homepage: www.quantbiolab.com

CAREER OUTLINE Solov'yov has a strong background in computational physics and biology. Since October 2013 he heads the quantum biology and computational physics research group (www.quantbiolab.com) at the University of Southern Denmark (SDU), Odense, Denmark. Solov'yov employs and extends methods of classical and quantum molecular dynamics, Monte-Carlo and multiscale techniques to model biophysical processes that involve chemical reactions, light absorption, formation of excited electronic states, transfer of excitation energy, and transfer of electrons and protons. Solov'yov has an extended expertise with high performance computing and simulations of large molecular systems exceeding 1 Mio atoms.

RESEARCH INTERESTS *Quantum and classical phenomena in biology and nanophysics* including (i) sensory systems in Nature and laboratory; (ii) magnetoreception mechanisms in animals; (iii) vibrationally assisted olfaction; (iv) computational biology and photobiology; (v) transformations in biomolecules; (vi) self-assembly and stability of molecular systems on the nanoscale.
Theoretical and computational methods including (i) classical and quantum molecular dynamics; (ii) multiscale approaches; (iii) Monte-Carlo based methods; (iv) free energy methods; (v) global optimization methods; (vi) linear scaling methods.

EDUCATION

A.F. Ioffe Physical-Technical Institute, Russian Academy of Sciences **2009**
St. Petersburg, Russia
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
Advisor: Prof. Dr. Andrey V. Solov'yov

Johann Wolfgang Goethe University Frankfurt am Main, Germany **2004**
Diploma in Physics with Honors
Thesis title: Ab initio and model description of atomic clusters
Advisors: Prof. Dr. h. c. mult. Walter Greiner, and Prof. Dr. Andrey V. Solov'yov

	St. Petersburg State Polytechnical University St. Petersburg, Russia	2004
	Bachelor of Sciences in Physics with Honors	
	<i>Thesis title:</i> Modeling of Lennard-Jones clusters	
	<i>Advisor:</i> Prof. Dr. Andrey V. Solov'yov	
	Lyceum “Physical-Technical High School” , Russian Academy of Sciences St.Petersburg, Russia	2000
	School-graduation certificate	
	Elm-Wood School , London, United Kingdom	in 1995
	Jacob Bruce Gymnasium №192 , St. Petersburg, Russia	1990 – 1998
	Elsa-Brandström School , Frankfurt am Main, Germany	1990 – 1992
HONORS, GRANTS, AND AWARDS	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 **2004**

Laureate of the *Student of the Year 2004* contest, St. Petersburg, Russia

Soros foundation (ISSEP) award **2003**

Laureate of the *Student of the Year 2003* contest, St. Petersburg, Russia

Regional state physics olympiad **2000**

Third degree diploma, St. Petersburg, Russia

RESEARCH
ACADEMIC

University of Southern Denmark

Department of Physics, Chemistry and Pharmacy, Faculty of Science, Odense, Denmark

Associate Professor

July 2014 – present

University of Southern Denmark

Department of Physics, Chemistry and Pharmacy, Faculty of Science, Odense, Denmark

Assistant Professor

October 2013 – June 2014

University of Illinois at Urbana-Champaign

Beckman Institute for Advanced Science and Technology, Urbana, Illinois, USA

Beckman Postdoctoral Fellow

December 2010 – October 2013

A.F. Ioffe Physical-Technical Institute

Russian Academy of Sciences, St. Petersburg, Russia

Research Fellow

2010 – present

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 Advanced Studies, Frankfurt am Main, Germany

Graduate Researcher

2005 – 2008

TEACHING
EXPERIENCE
(COURSES)

University of Southern Denmark

Department of Physics, Chemistry and Pharmacy, Faculty of Science, Odense, Denmark

Lecturer: Computational Physics, 30 students, (5 ECTS).

2017 – 2018

University of Southern Denmark

Department of Physics, Chemistry and Pharmacy, Faculty of Science, Odense, Denmark

Lecturer: Introductory Quantum Mechanics, 30 students, (10 ECTS).

2015 – 2018

University of Southern Denmark

Department of Physics, Chemistry and Pharmacy, Faculty of Science, Odense, Denmark

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”, a two-hours lecture in the framework of the course: “Computational methods in Meso-Bio-Nano Science” for graduate and post-graduate researchers

2011

Goethe University

Frankfurt Institute for Advanced Studies, Frankfurt am Main, Germany

Tutorial development: co-authored tutorials for the lecture course: 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

St. Petersburg, Moscow (Russia); Frankfurt am Main (Germany)

Mentoring high school students in physics, mathematics, chemistry, biology: weekly-basis discussions with students about their school program in natural sciences.

2002 – 2008

SUPERVISION

With ongoing, **1** Postdoctoral research associate; **2** Software developers; **6** Ph.D. students; **3** Masters students; **7** Bachelor students;

Peter Husen

Software developer, Odense, Denmark

May 2017 – present

Postdoctoral research associate, Odense, Denmark

April 2015 – May 2017

Vasili Korol

Software developer, Odense, Denmark

March 2015 – present

Peter Reinholdt

Ph.D. student, Odense, Denmark

September 2017 – present

Co-supervision with Jacob Kongsted.

Vikas Dubey

Ph.D. student, Odense, Denmark

April 2017 – present

Co-supervision with Himanshu Khandelia.

Ida Amalie Tolbll Friis

Ph.D. student, Odense, Denmark

September 2016 – present

Individual project, Odense, Denmark

in 2016

Claus Nielsen

Ph.D. student, Odense, Denmark

September 2015 – present

Emil Sjulstok Rasmussen

Ph.D. student, Odense, Denmark

September 2014 – present

Individual project, Odense, Denmark

in 2014

Angela Maria Barragan

Ph.D. student, UIUC, Urbana, Illinois, USA

November 2013 – present

Katrine Aalbæk Jepsen

Masters Student, Odense, Denmark

June 2017 – present

Bachelor Student, Odense, Denmark

February 2016 – June 2016

Anders Frederiksen

Bachelor Student, Odense, Denmark

February 2018 – present

Sarafina McPherson Kimø

Bachelor Student, Odense, Denmark

February 2017 – June 2017

Andreas Alberg Foldrup

Masters Student, Odense, Denmark

2018 – present

Bachelor Student, Odense, Denmark

February 2017 – June 2017

Adrian Bøgh Salo

Masters Student, Odense, Denmark

2018 – present

Bachelor Student, Odense, Denmark

February 2017 – June 2017

Individual project, Odense, Denmark

in 2015 – 2016

Anne-Sofie Fisker

Bachelor Student, Odense, Denmark

February 2016 – June 2016

Oliver Emil Skytte Glue

Bachelor Student, Odense, Denmark

February 2016 – June 2016

Co-supervision with Jacob Kongsted.

Anna Reese

Individual project, Odense, Denmark

in 2015

Simone Vestermann Samuelsen

Individual project, Odense, Denmark

in 2015

Sarafina Kimø, Martin Vangsgaard, Rasmus Hansen

First year project "Computer-aided nanofractal formation", Odense, Denmark in 2015

SUMMARY OF
PUBLICATIONS

97 peer reviewed scientific publications since 2002 including 69 journal publications, 12 book chapters, 6 refereed conference proceedings, 5 theses, 5 monographs/books; con-

tributed to **15** journal and book covers.

h-index of **24** with +1900 citations.

URL: <http://scholar.google.com/citations?user=dKpz7QkAAAAJ&hl=en>

RECENT

REPRESENTATIVE

INVITED TALKS

(OF 62 TOTAL)

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

Departmental Colloquium, University of Liverpool

Liverpul, United Kingdom

January 27, 2016

Theoretical insights into cryptochrome magnetoreception

16th International Congress on Photobiology

Córdoba, Argentina

September 09, 2014

From birds to molecules and beyond: the dawn of quantum biology

Department of Physics, Chemistry, Pharmacy, Inauguration colloquium lecture

Odense, Denmark

February 07, 2014

PEER-REVIEW

ACTIVITIES

Referee for 28 international journals

Applied Spectroscopy, Bioelectromagnetics, Biological Reviews, Biology Bulletin Reviews, Biophysical Journal, Biosensors, Carbon, 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 the American Chemical Society, Journal of Theoretical Biology, Journal of the Royal Society Interface, Nature Chemistry, Nature Materials, Nature Scientific Reports, Naturwissenschaften, 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

Journal of Nanotechnology (Hindawi Publishing Corporation), special Issue on “Fullerene-related nanocarbons and their applications”

Guest Editor:

in 2011

Plos One (Public Library of Science)

Academic Editor:

since October 2014

Scientific Reports (Nature Publishing Group)

Academic Editor:

since February 2017

PROFESSIONAL SERVICE

Conference and Symposia Organization

- Fifth International Conference “Dynamics of Systems on the Nanoscale” (DySoN 2018)*
Potsdam, Germany, October 8 – 12, 2016.
Symposium co-chair **in 2018**
- Oxford-Oldenburg-Odense (O3) annual symposium on magnetoreception*
Middelfart, Denmark, March 15 – 17, 2018.
Symposium chair **in 2018**
- Oxford-Oldenburg-Odense (O3) annual symposium on magnetoreception*
Middelfart, Denmark, September 08 – 10, 2016.
Symposium chair **in 2016**
- “Hands-on” Workshop on Computational Biophysics*
Odense, Denmark, October 12 – 16, 2015.
Local co-organizer **in 2015**
- Oxford-Oldenburg-Odense (O3) annual symposium on magnetoreception*
Odense, Denmark, June 17 – 18, 2015.
Symposium chair **in 2015**
- Symposium: “The Radical-Pair Mechanism as Magnetoreceptor Mechanism” at the 16th International Congress on Photobiology*
Córdoba, Argentina, September 09, 2014.
Symposium co-chair **in 2014**
- Interdisciplinary Symposium on Advanced Nano/Biosystems: Design, Fabrication, and Characterization*
Urbana, Illinois, USA, September 25 – 27, 2013.
Symposium co-chair **in 2013**
- Dynamics of Systems on the Nanoscale*
DySoN 2010, National Research Council, Rome, Italy, November 16 – 19, 2010.
Member of the local organizing committee **in 2010**
- Atomic cluster collisions: structure and dynamics from the nuclear to the biological scale*
ISACC 2009, Ann Arbor, Michigan, USA, July 14 – 18, 2009.
Member of the local organizing committee **in 2009**
- Atomic Cluster Collisions: structure and dynamics from the nuclear to the MesoBioNano scale*
ISACC 2008, St. Petersburg, Russia, June 3 – 7, 2008, Europhysics Conference.
Member of the local organizing committee **in 2008**
- Atomic Cluster Collisions: structure and dynamics from the nuclear to the biological scale*
ISACC 2007, GSI, Darmstadt, Germany, July 19 – 23 2007, Europhysics Conference.
Member of the local organizing committee **in 2007**
- Professional Affiliations**
- American Chemical Society
Member **2017**
- MBN Research gGmbH (www.mbnresearch.com)
share holder and co-founder **2016 – present**
- SDU eScience Centre (escience.dias.sdu.dk)

*Affiliated member***2014 – present**

Physicalisches Verein, Frankfurt am Main, Germany

*Member***2006 – 2010****OUTREACH****Computational microscope for biomedical applications***Presenter:* video interview about the Lundbeck Foundation Young Investigator Grant.

University of Southern Denmark, Odense, Denmark.

24 January 2015YouTube link: <https://www.youtube.com/watch?v=GMcktwvK-s>**Fruit flies and the smell sense: how a molecule's vibration can change its smell***Presenter:* video interview for general audience about biophysical mechanisms of olfaction.

Beckman Institute, Urbana, Illinois, USA.

19 September 2012YouTube link: <http://www.youtube.com/watch?v=Oe5PW2KqImI>**Orientation of migratory birds in geomagnetic field***Visiting lecturer:* a two-hours course (in German), for high school students aimed to discuss the forefront research pursued at the Frankfurt Institute for Advanced Studies (FIAS) in the field of theoretical biology.

Taunusgymnasium Königsstein, Gymnasium des Hochtaunuskreises.

Königsstein, Germany

25 November 2010**MAJOR**

Kira Astakhova

Technical University of Denmark (DTU), Lyngby, Denmark

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

Exeter University, UK

Himanshu Khandelia

University of Southern Denmark (SDU), Odense, Denmark

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

**COMPUTER
SKILLS****Operating systems**

Unix/Linux, Microsoft Windows, Mac OSX.

Tools and programming languages

C/C++, Fortran, Basic, Pascal, Microsoft Visual Studio, Wolfram Mathematica, Tcl/Tk, some use of Unix shell scripts, HTML, PHP, Subversion control.

ApplicationsL^AT_EX, Microsoft Office (Word, PowerPoint, Excel, Access), Adobe Acrobat, Adobe Photoshop, Adobe Illustrator, Adobe Dreamweaver, Adobe Premiere, Autodesk 3D Studio Max, Autodesk Autocad, OriginLab Origin.**Molecular modeling software**

Gaussian, GAMESS, Firefly, DALTON, NAMD, Gromacs, Amber, LAMMPS, Chemcraft, VMD, GaussView.

LANGUAGES

Russian (native), English (fluent), German (fluent), and Danish (basic)