

Curriculum Vitae for Nicușor Tîmneanu

Contact

Department of Physics and Astronomy
Uppsala University, Box 516
S-751 20, Uppsala, Sweden
Tel: +46 - 704 25 09 26
Email: nicusor.timneanu@physics.uu.se

Personal

Born: 1973-09-26
Status: married, two children, one cat
Favourites: sci-fi, cheese, alpine skiing
Languages: English, Swedish, Romanian



Current employment and positions

- 2023: Head of Division for X-ray Photon Science (Röntgenfysik) at Uppsala University
- 2022: **Senior Lecturer/Associate Professor** in Biophysics at the Dept. of Physics and Astronomy (IFA)
- 2022: Programme coordinator for the Master's Programme in Biophysics at Uppsala University
- 2018: Teacher representative in the Council for Educational Development at the Faculty (TUR)



Qualifications and education

- 2023: **Distinguished university teacher** at the Faculty of Science and Technology, Uppsala Univ.
- 2009: **Docent in Physics** from Uppsala University, specialisation in Biophysics,
Lecture, “*Scattering theory – from the structure of proton to protein structure*”
- 2002: **PhD in Physics** from Uppsala University, specialisation Elementary Particle Physics,
Thesis, “*The colour of gluon interactions – Studies of Quantum Chromodynamics in soft and hard processes*”
- 1998: **MSc in Physics** from University of Craiova, specialisation Quantum Field Theory



Previous positions

- 2020-2022: Lecturer in Biophysics (25% temporary employment), Dept. of Physics and Astronomy
- 2018-2023: Teacher representative (20% appointment) in the Council for Educational Development
- 2014-2022: Researcher at Dept. Physics and Astronomy, Duties: 70% research, 30% teaching
- 2012-2013: Researcher in Molecular Biophysics, Uppsala University
- 2007-2011: Assistant Professor (forskarassistent) funded by the Swedish Research Council
Department of Cell and Molecular Biology, Uppsala University
- 2005-2006: Researcher in Molecular Biophysics, Uppsala University
funded by TUIXS (Tabletop Ultra Intense XUV Sources) FP6-NEST-Adventure
- 2003-2004: Postdoctoral fellow in Molecular Biophysics
- 1998-2002: Graduate student and teaching assistant (20% teaching)
at the Dept. of Radiation Sciences, Uppsala University
- 1997-1998: Research student in Quantum Field Theory group, Univ. of Craiova.
- 1995-1996: Exchange student at Uppsala Univ. with an EU-TEMPUS mobility grant.

Distinctions and awards

- 2015: Thalén prize, Royal Society of Sciences at Uppsala



Scientific achievements

My area of research is in ultrafast X-ray science. I am interested in interdisciplinary research in biophysics using femtosecond X-ray laser pulses to study the structure of biological systems. The X-ray pulse are so intense, they also create an extreme state of matter.

I have authored 102 peer-reviewed scientific publications with over 11000 citations to date. My h-index is 40 (Source Google Scholar). Three notable contributions

- Feasibility of detecting the Higgs boson through specific diffractive channels at hadron colliders [PRL 2002]. Ten years later, the Higgs boson was discovered at the LHC.
- Imaging biological nanocrystals with diffraction before destruction, [ACS Nano 2011], opened a new method for protein structure determination with X-ray lasers [Nature 2011].
- Ultrafast heating of water on femtosecond time scale with X-ray lasers [PNAS 2018] which received wide media attention as "the fastest way to boil water".



Experience as supervisor

I have supervised 4 MSc students in Physics and Biology, 5 PhD students (graduated 2012-2024) and I am currently supervising 4 PhD students (expected graduation 2025-2027).

Master students, main supervisor: Lars Anders Carlson (2006), Elsa Abreu (2008), Christina Vantaraki (2020), Harald Agelii (2023)

PhD students, main supervisor: Bianca Iwan (2007-2012)
Ibrahim Eliah Dawod (2019-2024)
Sebastian Cardoch (2020-present)

PhD students, co-supervisor: H. Olof Jönsson (2014-2017),
Clara Saak (2014-2019),
Christofer Östlin (2014-2019),
Pamela Svensson (2020-present)
Tomas André (2022-present)
Harald Agelii (2023-present)

Postdocs, main supervisor: Asawari Rath (2012-2013),
Kajwal Kumar Patra (2020-2021)

Appointments

- 2010: PhD thesis evaluation committee - Olov von Hofsten (KTH Stockholm)
2020: PhD thesis external evaluation - Vojtek Vozda (Charles University, Prague)
2021: PhD thesis evaluation committee - Erik Malm (Lund University)
2022: PhD thesis evaluation committee - Georgii Shamuilov (Uppsala University)



Research funding

- 2024-2027: Swedish Research Council, research project grant, main applicant
"ReFIXED: Resonant and Fluorescent Incoherent X-ray Emission and Diffraction", 3 935 000 SEK
- 2020-2023: Swedish Research Council, research project grant, main applicant
"FIXED: Fluorescent Incoherent X-ray Emission and Diffraction to determine protein structures", 3 200 000 SEK
- 2019-2023: European XFEL, funding for external PhD, co-applicant
"Simulations of Coherent Imaging at Free-Electron Lasers"
 (for doctoral student Ibrahim Eliah Dawod) 4 years PhD
- 2019-2021: Carl Tryggers Foundation, stipend, main applicant
"SFX – from nanocrystals to nanoplasma in a flash",
 (for postdoc Kajwal Kumar Patra) 600 000 SEK
- 2018-2019: STINT, Initiation Grant, co-applicant,
"Outrunning radiation damage in protein imaging using ultrafast energetic electron beams", network Uppsala and Arizona State University 150 000 SEK
- 2016-2017: STINT, Initiation Grant, co-applicant,
"Study of damage and orientation of proteins in vacuum upon investigation with an X-ray laser", network Uppsala and Melbourne University 150 000 SEK
- 2014-2018: STINT, Institutional Grant, main applicant
"Nanoplasma dynamics on femtosecond timescales",
 network Uppsala Univ. and CEA-Saclay Paris 1 310 000 SEK
- 2014-2017: Swedish Research Council, Röntgen-Ångström Cluster, co-applicant,
"Controlling sample integrity in X-ray Free-Electron Laser experiments: Exposure, heating and plasma dynamics in the time domain", 9 000 000 SEK
- 2012-2013: Uppsala Univ., postdoc funding, main applicant
"SFX – Serial Femtosecond X-ray Protein Crystallography",
 (for postdoc Asawari Rath) 1 450 000 SEK
- 2010: Swedish Research Council, travel grant, main applicant
"Nanocrystal imaging using intense and ultrashort X-ray pulses", 43 000 SEK
- 2009: Swedish Research Council, travel grant, main applicant
"Explosion of clusters in intense X-ray pulses", 27 000 SEK
- 2007-2011: Swedish Research Council, grant for Assistant Professor, main applicant
"Nuclear fusion with X-ray lasers", 4 000 000 SEK

Teaching experience

I have extended experience in teaching at all three levels at the university: Bachelor, Master and PhD courses at Uppsala University in the Physics, Biology and Engineering programmes. I am teaching fluently in English and Swedish (courses taught in Swedish are marked below with ★).



Doctoral student and teaching assistant in Physics (1998-2003)

- 1998 - 2003 : Quantum Mechanics advanced course (5 p, Master level, 40 students)
7 lectures in Scattering theory, 2 tutorials, 1 computer lab (4h)
- 1998 - 2002 : Elementary Particle Physics (5p., Master level), 1 lecture (2h) and 1 tutorial (2h)
- 2000 - 2002 : Nuclear and Particle Physics (5p., Master level), laboratory assistant
- 2001 - 2002 : Quantum Physics II (4p., Master level), laboratory assistant



Young researcher in Biophysics (2003-2013)

- 2003 - 2007 : Molecular Biophysics I (5p.) + Molecular Biophysics II (5p.), Master level (10-20 stud)
4 lectures on scattering and examination of the scattering part
- 2008 - 2010 : Bioimaging - from cells to molecules (5p., Master level)
4 lectures on scattering and examination
- 2009 - 2010 : Physical Biology of the Cell (5p., PhD level, 8 students),
coordinator of seminars for student groups
- 2011 - 2013 : Molecular Biotechnology Program (30p, Master level),
faculty examiner of Master theses (approx 10 theses per year)



University teacher in Physics (2013-present)

- 2013 - 2014 : ★ Mekanik HI (5 hp, Bachelor level, 70 students)
13 lessons/tutorials x 2 groups
- 2013 - 2014 : ★ Fysik 2 (Basåret, Preparatory year)
10 exercise tutorials, 1 group w/ 30 students
- 2016 - 2019 : ★ Naturvetenskap för grundläroprogrammet F-3 (3 hp., Bachelor level, 90 students)
1/2 course (mechanics), 4 lectures, 1 mechanics lab (3 h), examination
- 2018 - 2019 : ★ Naturvetenskap för grundläroprogrammet 4-6 (3 hp., Bachelor level, 30 students)
2/3 course (mechanics and optics), 6 lectures, 3 labs (3x3h), written examination
- 2014 - 2016 : Quantum Mechanics advanced course (10 hp., Master level, 40-50 students)
1/3 course (perturbation and scattering theory), 14 lectures and tutorials, examination
- 2014 - 2020 : Applied Molecular Physics (10 hp., Master level, 6-8 students)
1 guest lecture, supervision of student projects (1 project/year worth 3 hp)
- 2015 - 2020 : Free Electron Laser Science (10 hp., Master level, 6-8 students, given every second year),
course responsible, 3 lectures, student project module (5 hp), seminars
- 2015 - 2022 : Examiner or Subject Reviewer for 1-2 Master theses every year,
Physics and Engineering Physics program
- 2019 - 2022 : Project in Applied Physics (15 hp., Master level)
supervision of two students working on 15hp projects (15 hp)

- 2015 - 2021 : * Mekanik HI (5 hp., Bachelor level, 3 engineering programs, 70-100 students),
course responsible, 13 lectures, 13 lessons x 2 groups, examination
- 2017 - 2024 : Quantum Mechanics advanced course (10 hp., Master level, 40-50 students),
course responsible, (Dirac and Quantum dynamics), 15 lectures/tutorials, examination
- 2021 - 2024 : *Applied Physics for Molecular Biotechnology (5 hp., Bachelor level, 50 students),
course responsible, 10 lectures, group exercises, seminars, examination



University pedagogical training

- 1995: Methods of Teaching Physics (56 hours, equivalent of 3 weeks),
 Practice of Teaching Physics (56 hours / 3 weeks), University of Craiova
- 2004: University Teacher Training Course (4 weeks), Uppsala University
- 2011: Scholarly Teaching in Science and Technology (2 weeks), Uppsala University
- 2013: Doctoral Supervisor Training (3 weeks), Uppsala University



Pedagogical development

As part of the Council for Educational Development at the Faculty of Science and Technology, I have developed the following teacher training and courses:

- Scholarly Teaching in Engineering Education (2 weeks) - 2020
- Student-active and student-centered teaching and learning (3 hours) - 2019
- International Classroom (1 day) - yearly since 2018
- Workshops on the use of digital tools / Active Learning Classrooms (2 hours) - 2020-2022
- Course on inclusive teaching and equal opportunity (2x2 hours) - yearly since 2021
- Complementary supervision training course (2 half-days) - yearly since 2022
- Research ethics in doctoral education (3 hours) - 2024



Pedagogical leadership

Course responsibility: I was course responsible for

- *Mechanics HI* (2015-2021) - 5 hp, undergraduate level (3 bachelor engineering programs in Uppsala and one remotely at Campus Gotland). I coordinated a team with two teachers, 3 lab assistants, teaching 100 students/year.
- *Quantum Mechanics advanced course* (2017-2021) - 10 hp, graduate level (Master in Physics and Engineering Program in Applied Physics). I coordinate a team with two teachers, 2 lab assistants, teaching 40-50 students/year.
- *Applied Physics for Molecular Biotechnology* (2021-2024) - 5 hp, Bachelor level in Engineering. I coordinate a team with two teachers, 3 lab assistants, teaching 50 students/year.

Program responsibility: In 2019 I developed an education program, *International Master's Programme in Biophysics*, funded by the Faculty and by the Dept. of Physics and Astronomy. The program has started admitting students in 2022, and I am currently the programme coordinator.