

# Curriculum Vitae - Jens Olaf Pepke Pedersen

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## PERSONAL INFORMATION



Work: DTU Space & Polar DTU,  
Diplomvej 371, DK-2800 Kgs. Lyngby, Denmark  
Home: Mosevej 21, DK-3450 Allerød, Denmark  
Tel. 4525 9723 (work), 4814 0176 (home), 2891 8774  
(mobile), E-mail: [jopp@space.dtu.dk](mailto:jopp@space.dtu.dk), Webpage:  
<http://www.staff.dtu.dk/sitecore/content/Home/jopp>  
Born September 13, 1958 in Aabenraa, Denmark,  
married 1988 to *Kate Pepke Pedersen* (associate  
professor, Danish Army Academy), Danish citizen,  
three children:  
*Christine Pepke Pedersen* (MSc in physics, PhD-  
student in quantum optics, DTU); *Michael Pepke  
Pedersen* (BSc in nanoscience, MSc-student in  
biology, Univ. of Copenhagen);  
*Sarah Pepke Pedersen* (BA-student in ancient Greek,  
Univ. of Copenhagen)

## EDUCATION

- 1991 PhD in experimental atomic physics, University of Aarhus ( "Electron Correlation in Ion-Atom Collisions").
- 1986 MSc in physics and mathematics, University of Aarhus (Thesis in Danish on electron capture to highly charged, slow ions).

## RESEARCH AND TEACHING EXPERIENCE

**Danish Technical University, National Space Institute (DTU Space).** *Affiliated with the institutes Division for Innovation and Research Based Consultancy and Polar DTU (Center for Polar Activities)*

2003- Senior scientist

**The Royal Veterinary and Agricultural University, Denmark**

2001 External Associate Professor (6 months)

**Danish Center for Earth System Science**

1998-2003 Associate Professor

**Ørsted Laboratory, Niels Bohr Institute, University of Copenhagen**

1997-98 Associate Professor (1 year funded by Carlsberg Foundation)

1993-97 Assistant Professor

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## **Joint Institute for Laboratory Astrophysics, University of Colorado at Boulder, USA.**

1991-92 Research associate (NASA funds)

## **Institute of Physics and Astronomy, University of Aarhus**

1989-90 Research Associate (Carlsberg Foundation).

1987-89 Graduate student scholarship (University of Aarhus).

1985-86 Student scholarship (Carlsberg Foundation).

## **Lawrence Berkeley Laboratory, Univ. of California at Berkeley, USA**

1987 Visiting scientist (6 months)

## **J. R. Macdonald Laboratory, Kansas State University, USA.**

1986-87 Research assistant

## **RESEARCH ADMINISTRATION / EVALUATION**

2011-12 Completed DTU leadership programme

1998-2003 Head of administration, Danish Center for Earth System Science.

1996-97 Scientific secretary for international evaluation of RISØ National Laboratory (employed 3 months by the Ministry of Research).

1993-94 Project Leader, evaluation of Mikroelektronik Centeret, DTU (employed 2 month by the Ministry of Education's Centre for Evaluation)

1995 Primary reviewer, EU 4th framework (Training and Mobility of Researchers).

Reviewer for several scientific journals (Atmospheric Physics and Chemistry, Journal of Aerosol Science, Advances in Space Research, Physical Review, Atmospheric Research, Computers & Geosciences, Journal of Physics B, Nuclear Instruments and Methods, Physica Scripta, Physics Letters). Reviewer for EU COST Actions.

Member of evaluation committees for several faculty positions at the assistant and associate professor level.

## **PUBLIC CONSULTANCY WORK / INNOVATION ACTIVITIES**

### *Report on multiuse of satellites and drones in the Arctic*

J.O.P. Pedersen: "Multiuse af en rumbaseret infrastruktur i Arktis", DTU, ISBN 13-978-87-91694-30-1 (2016) 66 pp. Analysis of the synergy potential in the dual (civil/military) use of satellites and drones in the Arctic regions of the Kingdom of Denmark. Funded by the Danish Agency for Science, Technology and Innovation. Preprint (2016) <http://www.pepke.dk/Multiuse.docx>

### *Report on dual use of satellites and drones in the Arctic*

J.O.P. Pedersen: "Synergipotential i satellitbaserede systemer og droner i Arktis", DTU, ISBN 13-978-87-92477-24-8 (2015) 27 pp. A mid-term analysis of the synergy potential in the dual

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(civil/military) use of satellites and drones in the Arctic regions of the Kingdom of Denmark. Funded by the Danish Agency for Science, Technology and Innovation.

## *Report on the Danish territorial air space*

”Afgrænsningen af det danske luftterritorium”, DTU Space, rapport 35 pp. Report for the Danish Ministry of Foreign Affairs (2015)

## *Collaboration with Greensteam*

Using satellite altimetry data to improve marine route planning. Funded by “Smart Innovation” – programme (2015/16)

## *Blue SIROS (Satellite Integrated Route Optimisation Service)*

Collaboration between DTU Space, DTU Transport, the Danish Maritime Authority, the Danish Defence Center for Operational Oceanography and the Danish Hydraulic Institute to develop an operational system for marine route optimization, which integrates modelling/forecasts of ocean currents based on near-real time satellite altimetry data. Funded by ESA (2015/16)

## *Real time surface current map for the North Atlantic*

Collaboration with DHI and the Danish Maritime Authority on producing an online-real time surface current map for the North Atlantic waters around Greenland. Funded by Orients Foundation (2016-18)

## *Collaboration with ClimateLab*

Using satellite altimetry data to verify and improve a commercial ocean model that is used for monitoring effects of climate change around Greenland. Funded by “Viden som vækstmotor”- programme (2014/15)

## **OTHER PROFESSIONAL ACTIVITIES**

2016- Member, Management Committee, EU COST Action CA15211 (Atmospheric Electricity Network: coupling with the Earth System, climate and biological systems)

2016- Member, Board of the Society for Dissemination of Natural Science (Selskabet for Naturlærens Udbredelse, [www.naturvidenskab.net](http://www.naturvidenskab.net))

2015-16 Member, DTU Space communications committee

2015 Member, Scientific Committee, Science for the Environment Conference, Aarhus, Denmark

2014-15 Member, Scientific Committee, Nordic Physics Days, Trondheim, Norway

2014-15 Member, Danish National Committee for the International Year of Light, [www.light2015.org](http://www.light2015.org)

2011-15 Member, Management Committee, EU COST Action ES1005 (Impact of Solar variability on climate)

2009-12 Member of Niels Bohr Lectures-committee.

2003- Board member, Danish Center for Earth System Science ([www.dcess.dk](http://www.dcess.dk))

2002- Board member, Bornö Oceanographic Station, Gullmarsfjorden

2000-06 Member, Advisory Editorial Board, Europhysics News.

2000-04 Danish representative, Scientific Advisory Committee, European Physical Journal.

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1999- Member, Advisory Editorial Board, *Aktuel Naturvidenskab*.

1998- Editor, *Kvant/Tidsskrift for Fysik og Astronomi*. (Editor-in-chief from 1998-2004)

1998-2000 Member, Council of the European Physical Society

1998-2000 President, Danish Physical Society.

1995-2000 Member, Danish National Committee for Physics (IUPAP) (President 1998-2000)

1995-2000 Chairman, Atomic Physics Section, Danish Physical Society.

1995-97 Member, Library Committee, Niels Bohr Institute, University of Copenhagen

## **Professional honors:**

2001 Honorary member of the Danish Physical Society

2000 Fellow of the Institute of Physics (UK)

2000 Public outreach prize, Faculty of Natural Sciences, University of Copenhagen.

I have been declared qualified as Professor in atomic physics and in climate physics.

## **PUBLICATIONS**

H-index: 23. My citation count exceeds 1,500 with more than 1,150 papers citing my work.

Author or co-author of 60 refereed international publications. Invited speaker at approximately 50 international conferences, larger workshops, and universities.

## **TEACHING EXPERIENCE**

### ***FORMAL PEDAGOGIC TRAINING***

1984: Completed course on physics demonstration experiments (required for high school teaching)

1993: Completed course on "Teaching and Learning in Higher Education"; University of Copenhagen

1994: Completed course on "Popular science writing", organized by the Danish newspaper "Weekendavisen" (series of lectures and writing exercises that were evaluated by journalists).

I am a long-term member of DUN, a Danish Network for Educational Development in Higher Education (a society whose purpose is to develop the quality of university education and university teaching).

## ***EXPERIENCE***

### ***PhD level***

2015, 2016: Lecturer on the PhD course on Modern Physics (DTU)

2000, 2002, 2004: In these three years I organized a one week Ph.D. course on "Earth System Science", that was held at Bornö Oceanographic Station in Sweden. The course was attended by 15-20 PhD students from Denmark and abroad and students were credited 5 ECTS. The course dealt with the evolution and workings of the whole Earth system (climate, atmosphere, oceans, life forms, geochemical cycles...) over the Earth history in the context of simple conceptual and mathematical

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models. The daily schedule was lectures in the morning, some free time after lunch (for fishing, swimming, walks etc.), and project work / on site measurements in the afternoon, and a summary of the project work and student talks in the evening. I lectured myself on the carbon cycling.

2002 and 2009: In these two years I was a lecturer at a Ph.D. course at the University of Copenhagen on "Forcings and feedbacks in the climate system".

2002: Organizer of a weekly "Climate group seminars", University of Copenhagen, directed at PhD and MSc-students, often giving the seminars myself.

1995: Organizer and lecturer, Ph.D. course in "Detection of photons, neutrals, and charged particles", University of Copenhagen

1994: Organizer and lecturer, Ph.D. course in "Selected Topics from Modern Optics", University of Copenhagen

I have supervised 2 experimental PhD projects: Giuseppe de Filippo (1995-1998), Martin Enghoff (2004-2007) and currently have 1 PhD student (Magnus Folving Sigersdal, 2016-).

## *Masters level*

2013- : I took the initiative to a course on "Earth System Science" (30750) that was eventually approved as a part of the new Earth and Space Physics Engineering master program at DTU. I am now teaching the course for the 4th time this spring. The students gain an advanced understanding of the Earth System and global change science and through a project work also gain experience with Earth System modelling.

2012- : Lecturer at the course "Measurement Technologies in Earth and Space Physics" (30200) coordinated by Henning Skriver. Last fall for the 4th time.

2002-08: Lecturer at the course "Simple Climate Models", University of Copenhagen, organized by Peter Ditlevsen.

1993-1996: Lecturer in "Laser Physics", University of Copenhagen. This is a course that had started as a reading group, but when I arrived at the institute, I turned it into a regular master's level course, developed the teaching goals, curriculum and exercises. Through private funding I was able to set up a laboratory for experimental laser and optics exercises. The last year I gave the course, it received the best overall student evaluation of all courses at the Niels Bohr Institute.

I have supervised 5 MSc-projects at the University of Copenhagen and a large number of student colloquia (requirement for the MSc programme at the Niels Bohr Institute). I am currently supervising 1 MSc-project on modelling of past climate.

## *Bachelor level*

2015-: Supervisor of two short term (10 ECTS) student projects.

2014- : Lecturer in the course "Geophysics" (30140) that I have set up and organize with Arne Døssing. My lectures (1/3 of the course) covers the Earth climate system. The course is now given for the 3rd time.

2001. Lecturer in "Meteorology and Climatology", The Royal Veterinary and Agricultural University.

1996: Lecturer in "Atomic physics I", University of Copenhagen.

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1993-96: Teaching assistant (theoretical exercises) in “Atomic physics I”, University of Copenhagen.

1987-90: Teaching assistant in Laboratory course on “Digital electronics”, University of Aarhus.

I have supervised approximately 20 bachelor projects at the University of Copenhagen and at DTU Space. I am currently supervising a “Fagprojekt” on climate modelling at DTU Space.

## *University extension programmes*

2003 Lecturer in Meteorology (Folkeuniversitetet), 13 week course.

2000- I have given a number of smaller lecture series (3-5 lectures) (Copenhagen and Roskilde), and contributed to lecture series on the Universe (lectures in Copenhagen, Aarhus, and Herning). Within the last year the topics were “Changes in the Arctic”, “The Earth System”, and “Climate Change”. One of my lectures on Life in the Universe (given at Aarhus University) attracted an audience of 1,000.



During the last 15 years I have also given many lectures for students at high schools or for visiting high school classes, in addition to less frequent lectures in elementary schools, at adult education programmes (“Folkehøjskoler” and “Senioruniversitetet”) and organizations and societies (such as Rotary, astronomical clubs, church communities, professional societies etc.).

## **ACADEMIC ASSESSMENT WORK**

I have been external examiner at a PhD project at the University of Lund and at the University of Copenhagen. I am a frequent external examiner at MSc thesis examinations and at PhD qualifying exams (“del A eksamen”), having during the last 20 years been examiner on approximately 75 MSc theses and “Part A” reports (corresponding to MSc-level) at the Universities of Aarhus and Copenhagen. I have been external examiner at approximately 25 BSc thesis exams at the Universities of Aarhus and Copenhagen. I cover a broad range of topics from geophysics, climate physics, to experimental and theoretical atomic, molecular, and optical physics.

I am also a very frequent examiner at written and oral exams at the University of Aarhus (previously also at the University of Roskilde) at all levels and in a broad range of courses. Within the last three years, I have for example, been a regular external examiner at BSc-level courses in “Mechanics and thermodynamics”, “Electrodynamics”, “Atomic-, molecular-, and optical physics”. At the MSc-level, I have been external examiner in “Advanced quantum mechanics”, “Particle penetration in matter”.

I have also experience as a member of committees dealing with student examination complaints.

## MAJOR FUNDING

- 2016 DTU, 50,000 DKK (Preparation of H2020 application on Effect of climate change on Arctic permafrost)
- 2016 DTU/NTNU, 1,500,000 DKK (3 year PhD grant)
- 2015 Orients Fond, 780,000 DKK (Online map of sea surface currents).
- 2015 ESA, 750,000 DKK (DTU Space share) (Route optimization using modelling/forecasts of ocean currents based on near-real time satellite altimetry data)
- 2015 Smart Innovation, 150,000 DKK (speed optimization for marine vessels, Greensteam)
- 2014 Viden som vækstmotor, 100,000 DKK (verifying ocean models for Greenland waters, Climate Lab)
- 2010 Danish Research Council, 2,011,645 DKK (new reaction chamber and post.doc. salary)
- 2009 Knud Højgaards Foundation, 250,000 DKK (new reaction chamber)
- 2009 Nordforsk network, Nordic/Baltic collaboration on aerosol, DTU share ca. 360,000 NKK
- 2008 Carlsberg Foundation, 1,563,000 DKK (3 years post.doc. salary)
- 2007 Danish Research Council, 180,000 DKK for apparatus (Condensation Particle Counter)
- 2003 Danish Government (as part of the Financial Bill negotiations), 12,000,000 DKK for sun-climate research at the Danish Space Research Institute
- 1997 Carlsberg Foundation, 462,000 DKK (own salary)
- 1995 Danish Natural Science Research Council, 1,300,000 DKK (general grant)
- 1994 Danish Natural Science Research Council, 201,282 DKK (apparatus)
- 1994 Danish Natural Science Research Council, 371,507 DKK (post.doc. salary)
- 1991 Danish Natural Science Research Council, 128,000 DKK (apparatus)
- 1990 NOVO, Ib Henriksens Foundation, and CERN, 225,000 DKK (apparatus)

## REFERENCES

### **Public consultancy work:**

Dr. Niels Andersen, Polar DTU & DTU Space, na@space.dtu.dk, Tel 4525 9783, Mob 21274365

### **Geoscientific modelling:**

Prof. Gary Shaffer, Niels Bohr Institute, University of Copenhagen, and GAIA-Antarctica, Universidad de Magallanes, Punta Arenas, Chile, gs@nbi.ku.dk, gary.shaffer@ceaza.cl, Tel 3532 0612

### **Recent experimental collaboration with the University of Aarhus:**

Prof. Ulrik Uggerhøj, Institute for Physics and Astronomy, University of Aarhus, ulrik@phys.au.dk, Tel+Mob 23382373.

### **Recent experimental collaboration with Boulby Underground Science Facility**

Dr. Sean Paling Boulby Underground Science Facility, s.m.paling@sheffield.ac.uk, Tel (+44) 1287 646300, Mob (+44) 781 552 0853

### **Recent experimental collaboration with the University of Tsukuba**

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Dr. Shigeo Tomita, Institute of Applied Physics, University of Tsukuba, [tomita@bk.tsukuba.ac.jp](mailto:tomita@bk.tsukuba.ac.jp),  
Tel (+81) 29 853 5337, Mob (+81) 80 348 70908

## Past collaboration with CLOUD

Dr. Jasper Kirkby, CERN, [Jasper.Kirkby@cern.ch](mailto:Jasper.Kirkby@cern.ch), Tel (+41) 22 76 74593, Mob (+41) 22 76 487419

MSc. (Eng) Antti Onnela, CERN, [antti.onnela@cern.ch](mailto:antti.onnela@cern.ch), Tel (+41) 22 76 75758, Mob (+41) 22 76 75758

## PUBLIC OUTREACH



I find that public outreach is an integral part of scientific responsibility, and I am author of approximately 150 popular science articles in Danish and a few in English (a partial list can be found in my list of publications).

I have been a permanent science writer for the weekly newspaper Weekendavisen (circulation 55,000,

<http://www.weekendavisen.dk/medarbejderliste#>) since 2003. I generally contribute 10 major articles per year and since 2005 I have contribute to a weekly column (“Falsificeret”) on new and surprising scientific discoveries that falsifies previous knowledge. I have often been complimented for good reads and at the same time giving balanced and nuanced descriptions of complicated issues.

I have built a network to science journalists at all major Danish news outlets, often providing background information, but I also serve as interview person in fields. I limit this to fields, where I feel qualified based on my research experience, but during a year I typically participate in 4-5 TV or radio interviews and 7-8 web- or printed media interviews.

My popular outreach lectures are mentioned in my teaching portfolio. Recent media activities can be found on my DTU web page

[http://www.space.dtu.dk/Om\\_dtuspace/Medarbejdere/Alle/Person?id=38289&cpid=45443&tab=4&qt=dtueventquery#tabs](http://www.space.dtu.dk/Om_dtuspace/Medarbejdere/Alle/Person?id=38289&cpid=45443&tab=4&qt=dtueventquery#tabs)

I am fluent in Danish, English, and German, with an intermediate level in French and an elementary level in Spanish.



## **OTHER EXPERIENCES**

- 2002-10* Chairman, Tax appeal board (Skatteankenævn) for Allerød, later Fredensborg
- 2006-10* Member, Network on climate, energy and environment, Danish Liberal Party
- 1999-2005* Member, National advisory panel on research policy, Danish Liberal Party
- 1988-* Private, Danish National Guard (received 25 year National Guard Service Medal in 2014)
- 1985-88* Private, Civil Defence Corps
- 1983-84* Member, board of the Danish Association for the United Nations
- 1983* Member of the Danish Delegation to the United Nations General Assembly, New York, Delivered the Danish speech on two agenda items: the International Youth Year and Channels of Communication with the UN
- 1982-84* Member, board of the Aarhus branch of the Danish Association for the United Nations
- 1981-82* Member, Danish National Commission for UNESCO and of the scientific committee of the National Commission
- 1981-82* Member, board and executive committee of the Danish Youth Council, chairman of its International committee and head of youth delegations to Central Europe, Middle East, Sovjet Union and North Korea.
- 1981-82* Member, Youth Council of the European Community
- 1981-82* Member, board of the *All-European Youth* and Student Cooperation (AEYSC)
- 1981-82* Member, executive committee of Council of European National Youth Committees
- 1982-83* Member, Youth committee, Danish Liberal Party
- 1981-82* Treasurer, Danish Liberal Youth organization
- 1980-82* National board member, Danish Liberal Youth organization
- 1980-81* International secretary, Danish Liberal Student Organization
- 1977-78* One year travel through the Middle East, Afghanistan, Pakistan, India, Bangle Desh, North-, Central- and East Africa. Wrote a series of travel stories for local newspapers.

From around 1995 to around 1983 I was a very active participant in a number of youth organizations, experiencing a large variety of activities. This gave me experience of both a practical kind such as organizing conferences, seminars and campaigns, publishing magazines, running efficient meetings, efficient public speaking, motivating people to volunteering at the local level etc. It also gave me a good insight in the political process and the analysis of political issues. While I have since avoided political jobs or offices, I have kept and developed good relations to a number of active politicians from different political parties, often helping with background information to political issues, suggestions for political initiatives or questions in Parliament.

## PERSONAL INTERESTS



Long distance running (limited to a maximum of a half marathon, most recently the DTU half marathon from Ballerup to Lyngby Campuses). (<http://www.dcess.dk/SFhilsen.wmv>)

Forestry and hunting. I manage 42 ha (100 acres) of forest on the island of Bornholm, using a sustainable forest program and in professional collaboration with the Danish Forest Owners Association. Average annual production is about 100 m<sup>3</sup>, but I like the long time scales involved in forest growth.

Philosophy. My particular interests are the philosophical foundations and consequences of quantum mechanics, existentialism, and the complementarity of science and religion. Together with Associate Professor Bjørn Thomassen, Roskilde University, I am currently writing a book (in Danish) on the

interaction between science and Christianity (to be published by Kristeligt Dagblads Forlag, <http://forlag.kristeligt-dagblad.dk/>)