# Curriculum Vitae

**Jane H. Nielsen, PhD**
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## Personal

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| Born | January 21, 1972 (born Hvolbæk Larsen) |
| Status | Married to Jakob Birkedal Nielsen, two daughters (Frida 2002, Josefine 2006) |
| Address | Marianelundsvej 7, 3460 Birkerød |

## Education

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| 1995 | M.Sc. degree, EE, Dept. of Physics, DTU |
| 1998 | Ph.D. degree in Physics, Center for Atomic-scale Materials Physics (CAMP), DTU |

## Professional experience

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| Jul-Aug 1994 | Laboratory assistant at Haldor Topsøe, A/S |
| Sept-Dec 1998 | Research associate at CAMP, DTU |
| 1999 | Research associate (*Post Doc*) at Dept. of Chemistry, University of Washing ton |
| 2000-2002 | Assistant Professor (*adjunkt*) at Dept. of Physics, DTU |
| 2002-2007 | Member of the Danish Research Training Committee (*Forskeruddannelse-sudvalget, FUU*), which advised the Danish Research Coordination Committee (*Koordinationsudvalget for Forskning, KUF*) in research education matters |
| 2003- | Associate Professor (*lektor*) at Dept. of Physics, DTU |
| 2005- | Member of the Danish National Research Foundation's Center for Individual Nanoparticle Functionality (CINF) – www.cinf.dtu.dk – located at DTU. Group leader of the Microscopy Unit. |

## Research

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| Interests | Experimental surface science, ultra-high vacuum (UHV) experiments, production and characterizaation of structures on the atomic-scale, scanning tunneling microscopy (STM), single crystals, alloy systems and gas induced segregation, correlation of morphology and functionality of metal nanoparticles, nanosize-effects in heterogeneous catalysis. |
| Design experience | Designed and constructed several UHV chambers, e.g. equipped with STM and a number of surface analysis tools (x-ray photoelectron spectroscopy, ion scattering spectroscopy, mass spectrometry). |
| Publications | Published 22 papers in refereed journals giving rise to 580 citations and a Hirsch index of 12[1].<br>Co-author of two chapters in the newly published book (in danish) aimed at high school students; "Nanoteknologiske horisonter". |

[1] ISI database search (March, 2009) using Author=(NIELSEN JH OR LARSEN JH) AND Address=(Dept Phys AND Tech Univ Denmark OR Dept Chem AND Univ Washington)

## Teaching related activities

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| Director of studies | Responsible for planning, coordinating and handling the Physics and Nanotechnology bachelor education, initiated in 2004 |
| Nanoteket | Leader of "Nanoteket" – a modern experimental teaching facility at DTU which supplies physics exercises for DTU students (mainly on the Physics and Nanotechnology bachelor education) and students from high schools. In 2007, approximately 70 high school classes (*gymnasie, HTX*) came to Nanoteket to perform one of our exercises, and until now in 2008, 60 classes have been here. See more on www.nanoteket.dtu.dk. In Nanoteket we have advanced computer assisted measurement equipment and we have an impressive collection of 10 scanning probe microscopes (STM and AFM) for student use. |
| Courses | - Course responsible and coordinator for the first year course on the Physics and Nanotechnology bachelor education called "Introduction to Physics and Nanotechnology" (no. 10030). The course consists of seven parts of which I am actively teaching two:<br>1) "Carbon nanotubes" where the students for example use the AFM and STM in Nanoteket to study the atomic-scale and nanoscale properties of graphite and carbon nanotubes.<br>2) "Measurement technique" where the students are trained in performing accurate measurement and they participate in short experimental projects on research equipment in different labs at DTU.<br>- Course responsible in collaboration with Assoc. Prof. Sebastian Horch and Prof. Ib Chorkendorff on the master course "Experimental Surface Physics" (no. 10304) where the experimental and theoretical foundation of surface physics is presented.<br>- Course responsible for a PhD course on nanostructures and reactivity (no. 10506). |
| Supervisor | Supervisor for five M.Sc. projects (Kristina Pilt Ulriksen 2004, Jens F. B. Rasmussen 2005, Thomas Hummelshøj 2005, Kenneth Nielsen 2008, Tobias Johansson 2008)<br>Supervisor or co-supervisor for four Ph.D. students (Jakob Engbæk 2006, Kristina Pilt Ulriksen 2007, Søren Vendelbo expected 2009, Kenneth Nielsen expected 2011). |

## Memberships

American Vacuum Society
American Chemical Society

## Honors and awards

Direktør Gorm-Petersens Mindelegat, 2000
Fabrikant Ulrik Brinch og hustru Marie Brinchs Legat, 2005

# List of Publications

24. **Combined spectroscopy and microscopy of supported $MoS_2$ nanoparticles**
Jane H. Nielsen, Kristina P. Jørgensen, Jacob Bonde, Kenneth Nielsen, Lone Bech, Yann Tison, Sebastian Horch, Thomas F. Jaramillo, and Ib Chorkendorff
Accepted Surface Science (2009)

23. **Batch chemical microreactors: Reversible, in-situ UHV sealing of a microcavity**
A. Monkowski, M. Johansson, J. H. Nielsen, I. Chorkendorff, and O. Hansen
Accepted Microelectronic Engineering (2009)

22. **Structure Sensitivity of the methanation reaction: $H_2$ induced CO dissociation on nickel surfaces**
M. P. Andersson, F. Abild-Pedersen, I. N. Remediakis, T. Bligaard, G. Jones, J. Engbæk, O. Lytken, S. Horch, Jane H. Nielsen, J. Sehested, J. R. Rostrup-Nielsen, J. K. Nørskov, and I. Chorkendorff
Journal of Catalysis 255 (2008) 6-19

21. **CO dissociation on Ni: The effect of steps and of nickel carbonyl**
Jakob Engbæk, Ole Lytken, Jane H. Nielsen and Ib Chorkendorff
Surface Science 602 (2008) 733-743

20. **Identification of active edge sites for electrochemical $H_2$ evolution from $MoS_2$ nanocatalysts**
Thomas F. Jaramillo, Kristina Pilt Jørgensen, Jacob Bonde, Jane H. Nielsen, Sebastian Horch, and Ib Chorkendorff,
Science 317 (2007) 100-102

19. **Decomposition of lithium amide and imide films on nickel**
Jakob Engbæk, Gunver Nielsen, Jane H. Nielsen, and Ib Chorkendorff
Surface Science 601 (2007) 830-836

18. **Growth and decomposition of lithium and lithium hydride on nickel**
Jakob Engbæk, Gunver Nielsen, Jane H. Nielsen, and Ib Chorkendorff
Surface Science 600 (2006) 1468-1474

17. **PtRu colloid nanoparticles for CO oxidation in microfabricated reactors**
Asbjørn Klerke, Souheil Saadi, Maja Bøg Toftegaard, Anders Theilgaard Madsen, Jane H. Nielsen, Søren Jensen, Ole Hansen, Claus Hviid Christensen, and Ulrich J. Quaade
Catalysis Letters 109 (2006)

16. **Biomimetic Hydrogen Evolution: $MoS_2$ Nanoparticles as Catalyst for Hydrogen Evolution**
Berit Hinnemann, Poul Georg Moses, Jacob Bonde, Kristina P. Jørgensen, Jane H. Nielsen, Sebastian Horch, Ib Chorkendorff, and Jens K. Nørskov
Journal of American Chemical Society 127 (2005) 5308-5309

15. **Methanol synthesis on potassium modified Cu(100) from CO + $H_2$ and CO + $CO_2$ + $H_2$**
M. Maack, H. Friis-Jensen, S. Sckerl, J. H. Larsen, and I. Chorkendorff
Topics in Catalysis 22 (2003) 151-160

14. **Methanol Decomposition on Pt/ZnO(0001)-Zn Model Catalysts**
A. W. Grant, J. H. Larsen, C. A. Perez, S. Lehto, M. Schmal, and C. T. Campbell
Journal of Physical Chemistry B 105 (2001) 9273-9279

13. **$N_2$ dissociation on Fe(110) and Fe/Ru(0001): What is the role of steps?**
R. C. Egeberg, S. Dahl, A. Logadottir, J. H. Larsen, J. K. Nørskov, and I. Chorkendorff, Surface Science 491 (2001) 183-194

12. **Molecular beam study of $N_2$ dissociation on Ru(0001)**
R. C. Egeberg, J. H. Larsen, and I. Chorkendorff
Physical Chemistry Chemical Physics 3 (2001) 2007

11. **Measurement of the energetics of metal film growth on a semiconductor: Ag/ Si(100)-2x1**
D. E. Starr, J. T. Ranney, J. H. Larsen, J. E. Musgrove, and C. T. Campbell
Physical Review Letters 87 (2001) 106102

10. **Catalyst dynamics: Consequenses for classical kinetic descriptions of reactors**
T. Johannnessen, J. H. Larsen, I. Chorkendorff, H. Livbjerg, and H. Topsøe
Chemical Engineering Journal 82 (2001) 219-230

9. **Adsorption energetics of Ag on MgO(100)**
J. H. Larsen, J. T. Ranney, D. E. Starr, J. E. Musgrove, and C. T. Campbell
Physical Review B 63 (2001) 195410

8. **Enthalpies of adsorption of metal atoms on single-crystalline surfaces by microcalorimetry**
J. H. Larsen, D. E. Starr, and C. T. Campbell
Journal of Chemical Thermodynamics 33 (2001) 333-345

7. **From fundamental studies of reactivity on single crystals to the design of catalysts**
J. H. Larsen, and I. Chorkendorff
Surface Science Reports 35 (1999) 165-222

6. **Role of steps in $N_2$ activation on Ru(0001)**
S. Dahl, A. Logadottir, R.C. Egeberg, J. H. Larsen, I. Chorkendorff, E. Törnqvist, and J.K. Nørskov
Physical Review Letters 83 (1999) 1814-1817

5. **Dissociative sticking of $CH_4$ on Ru(0001)**
J. H. Larsen, P. M. Holmblad, and I. Chorkendorff
Journal of Chemical Physics 110 (1999) 2637-2642

4. **Enhanced reactivity of pseudomorphic Co on Cu(111)**
J. H. Larsen, and I. Chorkendorff
Catalysis Letters 52 (1998) 1-5

3. **Increased dissociation probability of $CH_4$ on Co/Cu(111)**
J. H. Larsen, and I. Chorkendorff
Surface Science405 (1998) 62-73

2. **Designing surface alloys with specific active sites**
P. M. Holmblad, J. H. Larsen, I. Chorkendorff, L. Pleth Nielsen, F. Besenbacher, I. Stensgaard, E. Lægsgaard, P. Kratzer, B. Hammer, and J. K. Nørskov
Catalysis Letters 40 (1996) 131-135

1. **Modification of Ni(111) reactivity toward $CH_4$, CO, and $D_2$ by two-dimensional alloying**
P. M. Holmblad, J. H. Larsen, and I. Chorkendorff
Journal of Chemical Physics 104 (1996) 7289-7295