

# CURRICULUM VITAE

## SCHOOL EDUCATION

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- 06.1994 School-leaving Exam
- 09.1985 – 06.1994 Secondary School (Akademisches Gymnasium, Innsbruck and Neusprachliches Gymnasium, Stams)

## UNIVERSITY EDUCATION

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- 06.2010 HRTEM-EELS course at the University Service Facility on Transmission Electron Microscopy (USTEM), Vienna
- 11.2009 - 06.2010 University course on didactic qualification (“Hochschuldidaktik a la carte”) including case study “No pain, no gain - Probleme und Bruchstellen im neuen Studiengang Physikalische Chemie - Lösungsansätze durch die Erprobung didaktischer Strategien“
- 22.01.2004 PhD degree with distinction in Natural Sciences (Dr. rer.nat)
- 12.2000 - 01.2004 PhD Thesis: “Metal-support Interaction in catalysis: Pt and Rh nanoparticles in contact with reducible and non-reducible oxides”, Supervisor: Prof. Konrad Hayek, Institute of Physical Chemistry, University of Innsbruck
- 23.11.2000 Master’s degree in Natural Sciences (Mag. rer. nat)
- 10.1999 – 11. 2000 Diploma Thesis: “A study of the Peierls-Transition in the System Br/Pt (110) by STM and LEED”, Supervisor: Prof. Erminald Bertel, Institute of Physical Chemistry, University of Innsbruck
- 10.1997 – 06.1998 Training for a radiological safety officer
- 10.1994 – 10.1999 Studies of Chemistry at the Leopold-Franzens University of Innsbruck

## SCIENTIFIC CAREER

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- 01.2015-12.2015 FFG project **MicroPVDSOFC** with Joanneum Research, Leoben
- 10.2014 ESTEEM2 project “**Kinetics of the nanoscale Kirkendall effect in Pd-based intermetallic phases**” with TU Delft
- 11.2014 ESTEEM2 project “**Analytical HRTEM and tomography studies of the Fe segregation in Ni-perovskite systems**” with Ernst-Ruska Center @ Jülich
- 11.2014 ESTEEM2 project “**Operando HRTEM studies of the structure of the CO<sub>2</sub>-selective site of Pd/Ga<sub>2</sub>O<sub>3</sub> catalysts in methanol steam reforming**” with TU Delft
- since 09.2012 **Jury member** “Schaufenster Lehre”
- 10.2012 **Visiting Scientist**, Ernst-Ruska Zentrum für Mikroskopie und Spektroskopie mit Elektronen, Jülich  
Field of Research: Electron Microscopy investigations of small ZnO-supported ZnPd particles.
- 14.04.2011 **Habilitation (Venia Docendi) in Physical Chemistry**. Title of Thesis: “From pure oxides over oxide-supported metal and bimetallic particles to mixed oxides: model systems for catalytic and structural studies”
- since 04.2011 Senior Scientist, Institute of Physical Chemistry, LFU Innsbruck
- since 12.2010 Co-leader of the SFB sub-project “**Catalytic synergisms at (bi)metallic and oxidic phase boundaries and interfaces**”, FOXSI, together with Priv.-Doz. Bernhard Klötzer, Institute of Physical Chemistry, LFU
- since 04.2010 Co-leader of the FWF-project “**Defect distribution in pyroxenes under upper mantle conditions-monitor for**

**crystallisation conditions and potential application as sensor for silica activity and oxygen fugacity**", P 22367-N21, together with Prof. Stalder, Institute of Petrography and Mineralogy, LFU

- 07.2008 – 07.2011 Co-leader of the FWF-project "**From Oxide-supported Palladium to Pd Intermetallic Phases: Consequences for Methanol Steam Reforming**", P 20892-N19, together with Priv.-Doz. Bernhard Klötzer, Institute of Physical Chemistry, LFU
- since 2007 Several extended stays at the University Facility for Transmission Electron Microscopy (USTEM), Vienna and the Electron Microscopy Centre for Materials Science (EMAT), Antwerp
- since 2007 **Reviewer** for Journal of Catalysis, Applied Catalysis A, Journal of Physical Chemistry C, Physical Chemistry Chemical Physics, Monatshefte für Chemie, Advances in Physical Chemistry, Materials Chemistry and Physics, Materials Research Bulletin, Catalysis Today, Applied Physics A, Catalysis Communications, Journal of Molecular Catalysis A, Journal of Materials Chemistry, Crystal Growth and Design, Vacuum, Applied Surface Science, Colloids and Surfaces A: Physicochemical and engineering aspects, Materials Science in Semiconductor Processing, Functional Materials Letters, Applied Energy, Journal of Alloys and Compounds, ChemCatChem
- 07.2005 – 03.2011 University Assistant, Institute of Physical Chemistry, LFU Innsbruck
- 05.2004 – 05.2005 Post-doc Associate in Prof. Charles T. Campbell's research group at the University of Washington, Seattle, US, financially supported by the Austrian Science Foundation (Erwin-Schroedinger-grant)  
Fields of research:

1) *Non-contact AFM and STM studies of the growth and sintering of Pd nano-particles on Al<sub>2</sub>O<sub>3</sub> (0001) and CeO<sub>2</sub>(111)*

2) *XPS, LEIS and TPD studies of the interaction of O<sub>2</sub> and methane with Pd nano-particles on Al<sub>2</sub>O<sub>3</sub>(0001)*

- 12.2001 – 12.2003 Several extended stays at the Institute of Inorganic Chemistry, Fritz-Haber-Institute of the Max-Planck-Society, Berlin (High-resolution electron microscopy)
- 05.2001 – 12.2003 Co-worker in the Joint Research Project (JRP) “Gas-Surface Interactions”, FWF (Austrian Science Foundation), S-8105PHY
- 12.2000 – 01.2004 Student tutor in physico-chemical laboratories
- 12.2000 – 03.2001 Research assistant (half time), Institute of Physical Chemistry, University of Innsbruck

## ADMINISTRATION

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- 01.2013 - Member of habilitation committees, study programme committees (bachelor and master programmes chemistry for teachers, material and nano science), call committees, head of exam committees
- 01.2014- Speaker of the group “Reactivity” within the research platform “Advanced Materials” at the University of Innsbruck
- 04.2014-04.2016 Coordinator of Physical Chemistry within the joint project “QUALIMAT”
- 01.2014- Member of the faculty council “Chemistry and Pharmacy”

## RESEARCH AREAS and EXPERTISE

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- General  
Electron Microscopy and Materials Science  
Surface Science  
Heterogeneous Catalysis  
UHV-and HV technology  
Thin Film preparation and characterization  
Micro-reactor Kinetics

- Methods
  - Analytical Transmission Electron Microscopy (TEM)
  - Scanning Electron Microscopy (SEM)
  - Scanning Tunneling Microscopy (STM)
  - Atomic Force Microscopy (AFM)
  - Low-energy Electron Diffraction (LEED)
  - X-ray Photoelectron Spectroscopy (XPS)
  - Low-energy Ion Scattering (LEIS)
  - Thermodesorption Spectroscopy (TPD)
  - Raman and Infrared Spectroscopy
  - Volumetric Adsorption techniques
  - Electric Impedance Spectroscopy (EIS)
  
- Present Fields of Research
  - (High-resolution) Analytical Electron microscopy in heterogeneous Catalysis
  - Structure-activity correlations in pure and complex oxide catalysts and oxide-supported noble metal catalyst particles
  - Preparation and characterization of bi- and multi-metallic thin film catalyst systems
  - Catalytic studies in reforming reactions with special focus on methanol and methane steam reforming
  - Spectroscopic studies (FT-IR, Raman, EIS) of pure and complex oxide catalysts

## NON-SCIENTIFIC ADVANCED TRAINING ---

- 02.2013 Russian Language Course (60 h, B2-C1 level) at Russian in St. Petersburg, St. Petersburg, Russia
  
- 02.2012 Russian Language Course (80 h, B2 level) at Odessa Language School Centre, Odessa, Ukraine

- 11.2011-11.2012 Career-related distance study at Goethe-Institute, Munich and Karlsruhe: “Methodik und Didaktik des fremdsprachlichen Deutschunterrichtes (Methods and didactics of teaching German as foreign language)”

## TEACHING

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- Lectures and workshops on various subjects of Physical Chemistry and Materials- and Nanoscience (fundamental and advanced lectures on (Statistical) Thermodynamics, Kinetics and Electrochemistry, Structural Analysis and Electron Microscopy, STM and AFM, Catalysis, Thin Film Technology)
- Supervision of bachelor, diploma, master and PhD students, Post-Docs

## PUBLIC RELATIONS

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- Public talks at the European Researcher’s Night and/or at the “Lange Nacht der Forschung”, Institute of Physical Chemistry, University of Innsbruck on Electron Microscopy 2006-2008

## AWARDS

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- 27.01.2004 Erwin-Schroedinger grant of the FWF (Austrian Science Foundation)
- 17.11.2014 CAST Technology Award 2014 (Construction of an operando, ultra-dry reactor cell for FT-IR spectroscopy)