

CURRICULUM VITAE

Dr. habil. Andreas C. Scheinost

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PERSONAL INFORMATION

German citizen

EDUCATION

- 2005 Habilitation in Earth Sciences (HDR), Université Joseph Fourier, Grenoble, France. Topic of the habilitation these: *Mechanisms and kinetics of metal sequestration by microcrystalline soil minerals*
- 1994 Doctoral degree in Agronomy (Dr. agr.), Technische Universität München (TUM), Germany. Topic of the PhD thesis: *Pedotransfer-Funktionen zum Wasser- und Stoffhaushalt einer Bodenlandschaft*. Supervisor: Prof. U. Schwertmann (*summa cum laude*)
- 1989 Diploma in Agricultural Engineering (Dipl.-Ing. agr.), TUM, Germany.
- 1977 Allgemeine Hochschulreife, Gymnasium Trostberg, Germany.

PROFESSIONAL EXPERIENCE

- 4/2004 - now Director of the Rossendorf Beamline (ROBL) dedicated to high resolution diffraction and X-Ray Absorption Spectroscopy (XAS), at the European Synchrotron Radiation Facility (ESRF), Grenoble, France.
- 1/2004 - now Head of the Molecular Structures Division, Institute of Resource Ecology, Helmholtz-Zentrum Dresden-Rossendorf (HZDR), Dresden, Germany.
- 1/2003 - 12/2003 Head of the Synchrotron Application Division, Institute of Resource Ecology, HZDR, Dresden, Germany.
- 1/2000 - 12/2002 Assistant Professor (Oberassistent), Institute of Terrestrial Ecology, Eidgenössische Technische Hochschule Zürich (ETHZ) Switzerland.
- 4/1996 - 12/1999 Postdoctoral Research and Teaching Associate, Department of Plant & Soil Sciences, University of Delaware and Purdue University, USA.
- 1/1995 - 3/1996 Research and Teaching Associate, Institute of Soil Science, TUM, Germany.
- 10/1989 - 12/1994 PhD student, Institute of Soil Science, TUM, Germany.
- 9/1984 - 10/1989 Diploma student in Agricultural Engineering, TUM, Germany.
- 3/1981 - 4/1984 Farm manager "Hofgut Trenkmoos", Traunstein, Germany.
- 9/1977 - 2/1981 Training as "Staatlich geprüfter Wirtschaftler für Landbau", Fachschule für Landwirtschaft, Leutkirch, Germany.

LANGUAGES

German (native speaker)
English (fluent)
French (proficient)

MAJOR RESEARCH AREAS

- Molecular-scale processes and kinetics of retention and redox reactions at the mineral/water interface (clays, Fe oxides,...)
- Characterization of nano-particulate minerals with synchrotron methods
- Geochemistry of metals/metalloids/actinides with focus on the deep geological disposal of radioactive waste

TEACHING

Lectures

since 2004: HZDR or ESRF, once a year „Introduction to X-ray Absorption Spectroscopy“

SS 2002: ETHZ „Labor für Umweltingenieure“

FS 2001/02-FS 2002/03: ETHZ, lecture „Terrestrische Ökosysteme“

FS 1997/98: University of Delaware, lecture „Environmental Soil Mineralogy“

SS 1998: University of Delaware, lecture „Advanced Spectroscopic Methods in Environmental Soil Mineralogy

SS 1995: TUM, lecture „Bodenschutz“

SS 1995: TUM, „Bodenkundliches Laborpraktikum“

Advised or co-advised PhD Students

Maarten Nachtegaal / University of Delaware / 2003 (co-adviser)

The influence of competing sorbents on the dynamics and mechanisms of metal reactions in natural systems: A multiscale approach

Sabina Pfister / ETHZ / 2004

Long-term changes of Zn speciation, mobility and bioavailability in circum-neutral soil

Marc Schumacher / ETHZ / 2004

Micro-scale heterogeneity of organo-mineral soil colloids studied by x-ray microscopy and micro-spectroscopy

Irene Xifra / ETHZ / 2004

Spatial distribution and chemical speciation of Pb in contaminated soil and its relation to micromorphology and water flow

Marie Tella / Université de Toulouse III / 2009 (examiner)

Impact de la matière organique sur le transport de l'antimoine dans les eaux naturelles : étude expérimentale et modélisation physico-chimique

Harish Veeramani, EPFL Lausanne / 2010 (examiner)

Coupled biogeochemical processes for the reduction and immobilization of uranium

Elke Suess / Universität Bayreuth / 2011 (co-advisor)

Investigations towards a better understanding of arsenic-sulfur speciation in aquatic environments: Formation, stability, structural characterization, and conflicting analyses

Fabien Maillot / Université Paris VI / 2011 (examiner)

Structure locale des nano-oxyhydroxides de fer(III) de type ferrihydrite et schwertmannite

Regina Kirsch / HZDR and Université Joseph Fourier Grenoble / 2012

Réactions redox du plutonium et de l'antimoine avec des minéraux de fers en milieux anoxique

Laure Aimoz / PSI and Universität Bern / 2012 (co-advisor)

Structure of iodine in layered double hydroxides and cement phases

Guillaume Othmane / Université Paris VI / 2012 (examiner)

Spéciation de l'uranium dans l'environnement : Application aux opales de Nopal I (Mexique) et aux résidus miniers de Gunnar (Canada)

Amélie Leclercq / Université Nice Sophia Antipolis / 2013 (examiner)

Study of a protected catchment basin: inventory of natural and anthropogenic radionuclides

Marc Boland / University of New South Wales Kensington Australia / 2013 (examiner)

Fe(II)-accelerated Fe(III) oxyhydroxide transformation: geochemical controls and implications for contaminant reduction

Siriwan Dulnee / HZDR / 2015

Sorption and redox reactions of Sn^{II} at Fe mineral/water interfaces

Ezgi Yalcintas / KIT / 2015 (co-adviser)

Redox behaviour of Tc(VII)/Tc(IV) in dilute to concentrated NaCl and MgCl₂ solutions

Nicolas Boersig / KIT / 2016 (co-adviser)

Interaction of selenium with iron oxides and iron oxyhydroxides – investigation of the Se sorption and incorporation mechanisms

Sebastian Potsch / KIT / 2016 (co-adviser)

Structure of selenium-doped pyrite and the stability under oxidizing conditions with regard to the long term safety of geological repositories

Post-doctoral students

Delphine Vantelon / ETHZ / 2000-2003

Andreas Voegelin / ETHZ / 2001-2005

Andre Rossberg / HZDR / 2003-2006

Dipanjan Banerjee / HZDR / 2006-2012

Regina Kirsch / HZDR / 2012

Thomas Dumas / HZDR / 2012

Janeth Lozano / HZDR / 2013-

Robin Steudtner / HZDR / 2013-

Henar Rojo-Sanchez / PSI/KIT / 2013-2015 (co-adviser)

Guest scientists / sabbaticals

Prof. Roberto Colella / Purdue University / 2005

Dr. Marina Chukalina / Institute of Microelectronics Technology RAS / 2005-2006

Prof. Satoru Tsushima / Stockholm University / 2006-2007

Prof. Daniel Strawn / University of Idaho / 2007

Prof. Takumi Saito / University of Tokyo / 2010

PROFESSIONAL ACTIVITIES

Management & coordination

Scientific and administrative management of the Molecular Structures Division, Institute of Resource Ecology, Helmholtz-Zentrum Dresden Rossendorf (HZDR): 3 senior scientist, 2 post-docs, 2 PhD students, 2 technicians

Scientific and administrative management of the Rossendorf Beamline (ROBL) at the European Synchrotron Radiation Facility (ESRF) in Grenoble, France

(i) Duties within the European institution:

- Spokesman of the HZDR at the ESRF
- Member of the Collaborative Research Group (CRG) of the ESRF
- Safety officer
- In charge of ROBL user beamtime schedule

- Member of the proposal review panel
- Budget management (800 kEUR/a)
- In charge of the "ROBL II Upgrade-Program" (budget 2 Mio. EUR)
- Technical and scientific support to beamline users
- (ii) Management of the Radiochemistry station at ROBL
 - Responsible for the radiation protection and transport of radioactive samples

Review Panel of the ESRF, since 2014

Review Panel of ALBA, since 2014

Review Panel of the Canadian Light Source, since 2011

Clay Mineral Society, Councillor, 2010-2012

ACTINET-TALISMAN, European Network of Excellence, since 2004 coordinator of HZDR Pooled Facilities, since 2008 member of the Executive Committee

International Scientific Advisory Committee of "Actinide-XAS" since 2006

Chairman of the Committee VII (soil mineralogy) and member of the management board of the Deutsche Bodenkundliche Gesellschaft (DBG), 2001-2003

Scientific coordinator, Forschungsverbund Agrarökosysteme München (FAM), 1994-1996

On-going collaborations

Germany: Institut für Nukleare Entsorgung (Karlsruher Institut für Technologie), Forschungszentrum Jülich, TU Freiberg, Universität Bayreuth

Switzerland: Labor für Endlagersicherheit (Paul Scherrer Institut), ETHZ, École polytechnique fédérale de Lausanne (EPFL)

France: Commissariat à l'énergie atomique et aux énergies alternatives (CEA), Centre national de la recherche scientifique (CNRS), Université Joseph Fourier Grenoble

Spain: Universitat Politècnica de Catalunya, CIEMAT

Conference & work-shop organization

Conference Co-Chair: Journées des Actinides, Alpes d'Huez, 16.-20.03.2016

Session Chair: "Biogeochemical Redox Processes and Radiocontaminants", Goldschmidt Conference, Prague, 16.-21.08.2015

Session Chair: "Interaction of oxyanions with mineral phases: Sorption, redox transformation, and structural incorporation", Goldschmidt Conference, Firenze, Italy, 25.-30.08.2013

ROBL-RCH-Workshops, HZDR, annually since 2003

International Workshop on "Advanced Techniques in Actinide Spectroscopy (ATAS)", HZDR, Dresden, Germany, 5.-7.11.2012

Workshop „Actinide-XAS“, Hyogo, Japan, 29.02-5.03.2011

Session Chair: "Retention of radionuclides at the mineral-water interface with a focus on nanoparticles and solid-solution formation", Goldschmidt Conference, Knoxville, Tennessee, USA, 13.-18.06.2010

Workshop „Actinide-XAS“, Saclay, France, 15.-17.07.2008

Workshop „Actinide-XAS“, Karlsruhe, Germany, 18.-20.09.2006

Workshop „Actinide-XAS“, Berkeley, USA, 14.-16.09.2004

Symposium "Role of Minerals in Natural and Mediated Environmental Restoration" at the Clay Mineral Society (CMS) Meeting in Athens, Georgia, USA, 7.-12.06.2003

DBG-Tagung "Mineral Surface and Colloid Chemistry in Soil and Aquatic Environments", Karlsruhe, Germany, 8.-9.10.2002

DBG-Workshop "Synchrotron Methods in Mineral Surface Chemistry", Karlsruhe, Germany, 10.-11.10.2002

DBG/BGS Joint Meeting "Surface and Colloid Chemistry in the Soil and Aquatic Environment", Zürich, Switzerland, 20.-22.03.2000

Memberships

Geochemical Society

American Chemical Society

THIRD-PARTY FUNDING

2013-2015: EU TALISMAN: Transnational Access to Large Infrastructure for Safe Management of Actinides (450 k€)

2012-2015: Bundesministerium für Bildung und Forschung (BMBF) Verbundprojekt "Grundlegende Untersuchungen zur Immobilisierung langlebiger Radionuklide mittels Einbau in endlagerrelevante Keramiken" (Conditioning) (3 year post-doc position, 350 k€)

2012-2015: BMBF-Verbundprojekt "Grundlegende Untersuchungen zur Immobilisierung langlebiger Radionuklide durch die Wechselwirkung mit endlagerrelevanten Sekundärphasen" (ImmoRad) (3 year post-doc position, 444 k€)

2010-2012: Deutsche Forschungsgemeinschaft (DFG) Research Grant "Sorption and redox reactions of Sn^{II} and Sn^{IV} at the magnetite/water interface in presence and absence of organic ligands" (3 year PhD position, 140 k€)

2010-2012: EU FP7-PEOPLE-IRSES "Heavy Elements X-ray Absorption Spectroscopies Network" (70 k€)

2009-2013: EU ACTINET Integrated Infrastructure Initiative (350 k€)

2008-2011: Forschungszentrum Dresden (FZD) Research Grant "Abiotic Pu reduction by Fe(II): Elucidation of reaction mechanisms and kinetics" (4 year PhD position, 160 k€)

2006-2007: Alexander-von-Humboldt Stipendium "Quantum chemical investigations of aqueous actinide complexes", Prof. Satoru Tsushima, Stockholm University und Tokyo University (70 k€)

2006-2009: DFG Research Grant "In situ – Strukturuntersuchungen von Neptunium-Spezies in wässriger Lösung unter reduzierenden Bedingungen" (3 year post-doc position, 200 k€)

2005-2007: NATO Collaborative Linkage Grant "Investigation of the short-range structure of layered double hydroxides and phyllosilicates by EXAFS: Development of wavelet analysis" (45 k€)

2005: FZD-guest scientist research grant, Prof. R. Colella, Purdue University (10 k€)

2004-2008: ACTINET Joint Research Projects with i.e. University of Manchester, Université de Strasbourg, KTH Stockholm, UPC Barcelona, Hochschule Leuven and CEA (100 k€)

2004-2008: EU ACTINET European Network of Excellence (500 k€)

2002-2005: ETHZ "Long-term changes of Zn speciation, mobility and bioavailability in circum-neutral soil" (140 k€)

2001-2005: Swiss National Science Foundation (SNF) grant "Spatial distribution and chemical speciation of Pb in contaminated soil and its relation to micromorphology and water flow" (220 k€)

2001-2005: ETHZ "Micro-scale heterogeneity of organo-mineral soil colloids studied by X-ray microscopy and microspectroscopy" (200 k€)

1996-1998: DGF Research Grant "Diffuse Reflexionsspektroskopie und Farbmessungen zur qualitativen

SELECTION OF INVITED TALKS AND KEYNOTE LECTURES

23. Scheinost, A.C.; Dumas, Th.; Fellhauer, D.; Gaona, X.; Altmaier, M. *Is plutonium being incorporated by magnetite under anoxic conditions?*, 248th ACS National Meeting, 10.-14.08.2014, San Francisco, USA.
22. Scheinost, A. C., *Interfacial redox processes of actinides and fission products by nanoparticulate Fe(II) minerals*, ACTINIDES 2013, 21.-26.07.2012, Karlsruhe, Germany.
21. Martin, P. M.; Belin, R. B.; Prieur, D.; Delahaye, T.; Gavilan, E.; Lebreton, F.; Robisson, A. C.; Dumas, J. C.; Scheinost, A. C., *Local structure and charge distribution of Am bearing nuclear oxide fuels: (U,Am)O_{2±x} and (U,Pu,Am)O_{2-x}*, Plutonium Futures - The Science 2012, 15.-20.07.2012, Cambridge, United Kingdom.
20. Breynaert, E.; Dom, D.; Scheinost, A. C.; Kirschhock, C. E. A.; Maes, A. *Interaction of selenite with iron sulphide minerals: a new perspective*, 22nd Goldschmidt Conference, 24.-29.06.2012, Montreal, Canada.
19. Scheinost, A.C.; Rossberg, A., *Uranium at solid/water interfaces: Lessons to be learned from X-ray absorption spectroscopy*, International Workshop on Uranium Biogeochemistry: Transformations and applications, 11.-16.03.2012, Centro Stefano Franscini, Monte Verità, Ascona, Switzerland.
18. Scheinost, A.C., *Nuclear waste management: Current research at ROBL/ESRF*, GIANT/ILL/ESRF Expert Panel: Industry's needs for advanced characterisation, by neutron and synchrotron X-ray techniques, of materials for civil nuclear power, 03.04.2012, Grenoble, France.
17. Scheinost, A.C., *The Rossendorf Beamline at ESRF: A multipurpose X-ray absorption spectroscopy and scattering beamline for Environmental and Materials Sciences*, SESAME User Meeting 2011, 12.11.2011, Amman, Jordan.
16. Scheinost, A.C., *X-ray absorption spectroscopy for environmental sciences: examples and technical challenges*, SESAME User Meeting 2011, 12.11.2011, Amman, Jordan.
15. Scheinost, A.C.; Rossberg, A., *Advanced EXAFS analysis: Examples from mineral/water interface redox reactions*, J-ACTINET Computational Science School 2011, 05.-06.09.2011, Tokyo, Japan.
14. Scheinost, A.C., *Actinide redox reactions at the solid-water interface probed by XAFS*, J-ACTINET Meeting, 01.-02.09.2011, Tokyo, Japan.
13. Scheinost, A. C.; Hennig, Ch.; Rossberg, A.; Banerjee, D., *ROBL: The first European actinide XAS beamline in its second decade of operation*, Actinide-XAS 2011, 02.02.2011, Harima Science Garden City, Japan.
12. Scheinost, A. C.; Schmeisser, N.; Denecke, M.; Banerjee, D.; Dardenne, K.; Hennig, Ch.; Rossberg, A.; Rothe, J.; Daehn, R., *AcXAS, a reference data base for XAS spectra of actinides and other radionuclides*, ACTINET Plenary Meeting, 01.02.2011, Marcoule, France.
11. Scheinost, A. C., *Probing redox reactions at the mineral/water interface by X-ray absorption spectroscopy: Reduction of Se, Sn, Sb and Pu by Fe(II)-bearing minerals*, Seminar at Labor für Endlagersicherheit, Paul Scherrer Institut, 15.03.2011, Villigen, Switzerland.
10. Planer-Friedrich, B.; Suess, E.; Scheinost, A. C.; Wallschläger, D., *XAS versus IC-ICP-MS for arsenic-sulfur speciation analysis*, 11th International Conference on the Biogeochemistry of Trace Elements, 03.-07.07.2011, Florence, Italy.
9. Sobolev, O.; Cuello, G. J.; Scheinost, A. C.; Johnson, M. R.; Nikitenko, S.; Le Forestier, L.; Brendle, J.; Charlet, L., *The short range order of ions in clay minerals: Sm³⁺ coordination*, 10th International Workshop on Non-Crystalline Solids, 21.-23.04.2010, Barcelona, Spain.
8. Scheinost, A.C., *Probing redox reactions at the mineral/water interface by X-ray absorption spectroscopy: Reduction of Se, Sb and Pu by Fe(II)-bearing minerals*, Graduiertenkolleg "Spurenanalytik von Elementspezies: Methodenentwicklungen und Anwendungen", 23.03.2010,

Universität Mainz, Germany.

7. Scheinost, A.C., and Charlet, L., *Keynote lecture: Biogeochemistry of iron and interacting metals in soils*. XIII International Symposium on Iron Nutrition and Interactions in Plants, 3.-7.07.2006, Montpellier, France.
6. Scheinost, A. C., *Lead corrosion in soils*. World Symposium on Lead in Ammunition, 9-10.09. 2004, Rome, Italy.
5. Scheinost, A.C., Bernhard, G., and Selenska-Pobell, S. *Fate of uranium in the environment*. 13th Goldschmidt Conference, 5.-11.6.2004, Copenhagen, Denmark.
4. Scheinost, A.C., *Keynote lecture: Synchrotron-based X-ray absorption spectroscopy and microscopy to study natural organic matter*. 20th Anniversary Conference of the International Humic Substances Society, 21.–26.07.2002, Northeastern University, Boston, MA, USA.
3. Scheinost, A.C., *Zn speciation at the soil/root/water interface*. NSLS Annual Users' Meeting, 20.-23.05.2001, Brookhaven National Laboratory, Upton, NY, USA.
2. Scheinost, A.C., *XAS and micro-XAS for investigating metal retention by soils - Elucidating slow uptake and aging mechanisms*. Workshop Synchrotron Radiation Techniques in the Environmental Sciences, 11.–12.05.2000, Forschungszentrum Karlsruhe, Germany.
1. Scheinost, A.C., *The role of Al and Si in the retention of Ni by soil minerals*. International Workshop Surface Chemical Processes in Natural Environments, 1.–6.10.2000, Monte Verita, Ascona, Switzerland.