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Education

University of Hamburg, Germany	Physics	Ph.D., 1992
University of Hamburg, Germany	Physics	Diploma thesis, 1985
University of Paderborn, Germany	Physics	Prediploma, 1981

Professional Experience

2012-2013	Scientific consultant, Max-Planck-Institut für Mikrostrukturphysik, Halle, Germany. Computation and evaluation of nuclear resonant spectra of magnetic nano-materials.
2008-present	Visiting associate faculty, Division of Geophysical and Planetary Sciences, California Institute of Technology. Nuclear resonant and inelastic x-ray scattering methods in Earth science.
2010-2011	Senior Technologist (staff), Jet Propulsion Laboratory. Development and implementation of concepts for in-situ instruments on planetary surfaces in alignment with present and future NASA missions.
2009-2010	Senior Physicist (staff), Argonne National Laboratory. Development and application of nuclear resonant scattering techniques, inelastic x-ray scattering techniques, synchrotron instrumentation and methods. Mentor to junior scientific staff.
2004-2007	Group Leader, Argonne National Laboratory. Head of Inelastic X-ray and Nuclear Resonant Scattering group at the Advanced Photon Source.
2003-2010	Adjunct Professor, Department of Geology, University of Illinois at Urbana-Champaign.
1999-2009	Physicist (staff), Argonne National Laboratory. Development and application of nuclear resonant scattering techniques, inelastic x-ray scattering techniques, synchrotron instrumentation and methods.
1994-1999	Assistant Physicist (staff), Argonne National Laboratory. Development and application of nuclear resonant scattering techniques, synchrotron instrumentation, and methods.
1993-1994	Visiting Scientist, Argonne National Laboratory. Development of nuclear resonant scattering techniques. Development and implementation of synchrotron instrumentation and methods.
1992	Visiting Scientist, European Synchrotron Radiation Facility. Implementation of my evaluation software for nuclear resonant scattering data.
1992	Visiting Scientist, Argonne National Laboratory. Development of nuclear resonant scattering techniques.
1985-1993	Research Associate, University of Hamburg. Research on nuclear resonant scattering.

Major Accomplishments

- Discovered and developed nuclear resonant inelastic x-ray scattering (NRIXS) technique.
- Develops, distributes, and maintains comprehensive computer code to evaluate Mössbauer spectra, time-resolved nuclear resonant scattering spectra, and nuclear resonant inelastic x-ray scattering data.
- Discovered first non-Fe nuclear resonance of ^{169}Tm using synchrotron radiation.
- Lead the nuclear resonant scattering program at beam line 3-ID of the Advanced Photon Source.
- Developed, designed, and constructed a world-wide unique high temperature and pressure experimental setup at beam line 3-ID of the Advanced Photon Source with widespread use in geoscience.
- Oversaw design and construction of the inelastic scattering beam line 30-ID of the Advanced Photon Source.

Comprehensive Skills

- Mössbauer spectroscopy.
- Hard X-ray analytical techniques, XRD, XRF, XAFS, IXS, NRS, NRIXS.
- Hard X-ray and γ -ray instrumentation and detectors.
- Hard X-ray optical system engineering.
- Problem-solving strategies for complex instruments.
- Scientific software design and implementation.
- Programming languages: Fortran, IDL, Tcl/Tk, Unix shell scripts.
- Scientific publications and public presentations.
- German language.

Other Skills

- HV and UHV engineering practices.
- Isotope analysis using mass spectrometer.
- Laser system design, implementation, and operation.
- Cryogenic system design, implementation, and operation.
- Motion control software and hardware.
- High-pressure devices.

Postdoctoral supervision

A. Alatas (2002-2005), G.Bortel (1997-1999), M.Y. Hu (1999-2001), S. Kharlamova (2005-2008), C. L'abbé (2000-2002), M. Lerche (2005-2007), B. Leu (2006-2010), A. Said (2005-2008), T.S. Toellner (1996-1998), H. Yavas (2007-2010).

Graduate student supervision

L. Gao (2008-2010), P.M. Hession (1996-1998), M.Y. Hu (1994-1999), C.N. Kodituwakku (2004-2007), J.P. Sutter (1995-2000), T.S. Toellner (1993-1996), H. Yavas (2002-2007), Y. Xiao (2004-2007).

Synergetic Activities

- Develop novel nuclear resonant scattering (NRS) and inelastic x-ray scattering (IXS) techniques.
- Promote NRS and IXS through community outreach in conferences and workshops.
- Initiate and support novel applications of NRS and IXS, e.g., in biology, geology, nanoscience.
- Train young scientists in use and benefits of synchrotron techniques.
- Supervise operation of public NRS and IXS beam lines at the Advanced Photon Source.
- Committee member of the Department of Energy's Lehman review of the NSLS-II project, Brookhaven National Laboratory, 2009-2015.
- Committee member of the Department of Energy's Lehman review of the NEXT project, Brookhaven National Laboratory, in September 2010-2013.
- Representative of Argonne National Laboratory for the "Consortium for Materials Properties Research in Earth Sciences (COMPRES)" from 2003 until 2010.
- Chair of the Technical Advisory Committee for the High-pressure beam line (HP-CAT) at the Advanced Photon Source from 2006-2017.

Awards

- Pacesetter Award, 1997, Argonne National Laboratory.
- Director's Award, 1998, Argonne National Laboratory.
- Medal for Distinguished Performance, 2004, The University of Chicago.
- IBAME Science Award, 2021, International Board on the Applications of the Mössbauer Effect.