

Vasile Ovidiu Garlea

Neutron Scattering Division, Oak Ridge National Laboratory
P.O. Box 2008, Oak Ridge, TN 37831-6473
(865)-202-7546, garleao@ornl.gov
ORCID ID: <https://orcid.org/0000-0002-5322-7271>

BRIEF BIOGRAPHY

V. Ovidiu (Ovi) Garlea is instrument scientist at the HYSPEC spectrometer at the Spallation Neutron Source. He holds a courtesy appointment with the Department of Chemistry and Biochemistry at Florida State University and is adjoint associate professor at the Department of Materials Sciences and Engineering at the University of Tennessee. He served as lead instrument scientist at the HB2A Neutron Powder Diffractometer at High Flux Isotope Reactor where he oversaw the instrument installation and built a vibrant magnetic diffraction community. He has previously worked as a post-doctoral researcher at the Oak Ridge National Laboratory (2005-2007), at the Ames Laboratory (2003-2005) and at the Synchrotron Light Laboratory ELETTRA (2003). He received his PhD in solid state physics from Joseph-Fourier University, Grenoble, France in 2001.

Ovi Garlea studies strongly correlated electron systems and quantum magnets using diffraction and inelastic scattering techniques using polarized and unpolarized neutron. The research topics he is currently pursuing include:

- exotic magnetic ground states, such as incommensurate magnetic ordering and spin-liquid, arising from competing interactions in geometrically frustrated magnets
- magnetic phase diagrams magnetoelastic coupling in functional materials, such as multiferroics, magnetocaloric materials and shape-memory alloys
- the interplay of spin, orbital and lattice degrees of freedom in transition metal systems
- magnetic excitations in low dimensional quantum systems

Ovi Garlea initiated a workshop series on magnetic structure determination that runs regularly since 2009, and a workshop on Polarized Neutron Diffraction and Spectroscopy. He serves as a member in the International Union of Crystallography (IUCr) Commission on Magnetic Structure, authored a book chapter "Magnetic Structures" in Neutron Scattering - Magnetic and Quantum Phenomena, Vol. 48 (Academic Press, 2016), and published over 160 research articles in peer reviewed journals (with a *h*-index of 27). He is also a senior adviser for the new neutron diffraction instrument VERDI (Versatile Diffractometer for complex magnetic structure), proposed for the Second Target Station at SNS. Ovi Garlea is interacting with dozens of visiting scientists annually, and greatly enjoys his involvement in science education and outreach. Over the years he has hosted and mentored a number of undergraduates, graduate students and postdoctoral fellows from different universities including Florida State University, University of Tennessee, Clemson University, Georgia Tech, University of Virginia, and Louisiana State University.

EDUCATION

- 2001 Ph.D. in Physics, Joseph-Fourier University, Grenoble, France
- 1998 M.S. in Physics, Joseph Fourier University, France & Babes-Bolyai University, Romania
- 1997 B.S. in Physics, Babes-Bolyai University Cluj-Napoca, Romania

EMPLOYMENT

2013 – present: Instrument Scientist at the HYSPEC- Hybrid Spectrometer at the SNS, Neutron Scattering Division, Oak Ridge National Laboratory (ORNL)

- Co-responsible for operation of HYSPEC spectrometer.
- Commissioning and implementation of the wide-angle supermirror analyzer for XYZ polarized neutrons studies
- Providing support in development of data reduction and analysis workflow for inelastic data and polarized neutron scattering
- Leading several projects involving studies of static and dynamic properties of strongly correlated electron systems. Research topics currently pursued include:
 - exotic magnetic ground states such as incommensurate magnetic ordering and spin-liquid arising from competing interactions in geometrically frustrated magnets
 - magnetoelastic coupling
 - magnetic phase diagrams of functional materials
 - magnetic excitations in low dimensional spin-gapped quantum systems

2007 – 2013: Lead Instrument Scientist at the HB2A Neutron Powder Diffractometer at High Flux Isotope Reactor (HFIR), Neutron Sciences Directorate, ORNL

- Overseeing the installation of the HB2A high-resolution powder diffractometer at the HFIR
- Responsible for instrument operation, and establishing and expanding the user community
- Demonstrating and promoting the half polarization method for weak ferromagnets
- Performing neutron scattering studies of novel magnetic materials

2005 – 2007: Postdoctoral Research Associate, HFIR Center for Neutron Scattering, ORNL

- Providing support for the operation of HB1 triple-axis-spectrometer at HFIR
- Elastic and inelastic neutron scattering studies of orbital-spin coupled systems and quasi-1D spin gapped systems
- Single crystal growths by floating zone and flux techniques

2003 – 2005: Postdoctoral Research Associate, Neutron Scattering Group, Ames Laboratory & Iowa State University

- Co-responsible for operation of the HB1A triple-axis spectrometer at HFIR
- Studies of magnetic excitations in molecular magnets and martensitic alloys, and determining magnetic structures of magneto-caloric materials

2002– 2003: Postdoctoral Research Associate Synchrotron Light Laboratory, ELETTRA, Trieste, Italy

- Design and construction of a new powder diffraction beamline (MCX, Material Characterization by X-Ray Diffraction)
- Development and implementation of analytical software for the instrument control

1998 – 2002: Research Assistant, Laboratoire de Cristallographie, CNRS, Grenoble, France

- Synthesis of new delafossite derived oxides using solid state and exchange reactions, high pressure and sol-gel synthesis
- Neutron and x-ray diffraction experiments using ILL and ESRF facilities; Solving structures from powder diffraction data (ab-initio calculation, Fourier analysis)
- Resistivity and magnetization measurements; high magnetic field measurements (LCMI Grenoble)

1997 - 1998: Physicist, National Institute for Research and Development for Isotopic and Molecular Technology, Cluj Napoca, Romania

- Analysis of multi-component mixtures using mass spectrometry and chromatography
- Molecular structure determination

SYNERGISTIC ACTIVITIES

- Courtesy appointment with the Department of Chemistry and Biochemistry at Florida State University
- Adjunct associate professor at the Department of Materials Sciences and Engineering at the University of Tennessee
- Designing and senior adviser for the new neutron diffraction instrument VERDI (Versatile Diffractometer for complex magnetic structure), proposed for the Second Target Station at SNS
- Serving as a member in the International Union of Crystallography (IUCr) Commission on Magnetic Structures. The commission focus is to establish standards for the description and dissemination of magnetic structures and their underlying symmetries.
- Organizer and lecturer of the workshops series on Representational Analysis and Magnetic Structure Determination by Neutron Diffraction (hosted by ORNL & NCNR starting from 2009), and on Polarized Neutron Diffraction and Spectroscopy (2019-).
- Instructor at the National School on Neutron and X-ray Scattering: hands-on experiments at the HB2A and WAND diffractometers (2008-2012) and HYSPEC spectrometer (2013-preset).
- Referee for professional journals: Physical Review Letters, Physical Review B, Nature, Journal of Applied Crystallography, J. of Magnetism and Magnetic Materials, J. Alloys and Compounds
- Participate in the review panel for the neutron beam-time proposals submitted at the NCNR (2012-2016)
- Member of the Neutron Scattering Society of America, American Physical Society (APS), Materials Research Society (until 2020), American Chemical Society (until 2020)

- Mentored Dr. Peter Jiang and contributed to the science case for his successful DOE Early career research proposal entitled “Realization of Full Neutron Polarization Control: Next Generation Spherical Neutron Polarimetry for Neutron Scattering,”
- Mentoring a number of undergraduates, graduate students and postdoctoral fellows from different universities: Judy Clark - SCGSR -DOE program with FSU (2020/21), Liam Ritchie - Georgia Tech. (2020), Duminda Sanjeewa – Clemson Univ and MSTD-ORNL (2017-2020), Alexandra Mannig - ETZ Zurich - thesis defense committee (2017), Xiaoyan Tan, thesis-co-adviser - FSU (2016) Biao Hu - LSU (2010), Corey Thompson- FSU (2011, 2012); Dr. Keeseong Park - UV (2010); Ashley Coke, UT (2009, 2010) - TN Governor’s Academy for Mathematics and Science; Aaron Ferber, UT (2010)

AWARDS

- ORNL Significant Event Award - 2016, for the completion of commissioning of polarization analysis at HYSPEC
- ORNL Significant Event Award - 2009 for construction completion and introduction in the user program of the HB2A diffractometer at HFIR.