

## CURRICULUM VITA

### **Kenneth M. Kemner**

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### **Education**

**Ph.D.**, Physics, University of Notre Dame (Notre Dame, IN) *Sept. 1993*  
**B.Sc.**, Physics (*Cum Laude*), Xavier University (Cincinnati, OH) *June 1986*

### **Work Experience**

#### **ARGONNE NATIONAL LABORATORY / ENVIRONMENTAL RESEARCH DIVISION (JUL'96-OCT'05)** **/ BIOSCIENCES DIVISION (OCT'05-PRESENT)**

*Argonne, Illinois 60439*

**Title: Research Scientist**

#### **Description:**

Primary responsibility: 1) the development of a synchrotron-based environmental research program within the Environmental Research and Biosciences Division of Argonne National Laboratory with a subsequent focus on the incorporation of pyrosequencing and bioinformatics tools for metabolic and microbial community analysis. Primary scientific focus: mineral-metal-microbe interactions. Synchrotron-based characterization techniques include: 2D x-ray imaging (transmission, XRF, and phase contrast), x-ray microtomographic imaging (absorption and phase contrast), and XAFS.

**Supervisors:**

<i>Dr. S. T. Pratt</i>	<i>July '96 - Sept. '98</i>
<i>Dr. B. M. Lesht</i>	<i>Oct. '98 - Sept. '03</i>
<i>Dr. R. M. Miller</i>	<i>Oct. '03 - Oct. '09</i>
<i>Dr. C. G. Giometti</i>	<i>Oct. '09 - June '12</i>
<i>Dr. R. Graham</i>	<i>June '12 - Present</i>

**NAVAL RESEARCH LABORATORY**, Washington, D.C. 20375-5000  
Condensed Matter and Radiation Sciences Division

**Title: National Research Council Fellow**

#### **Description:**

Responsibilities include: 1) the investigation of the relationship between processing, structure and magnetic properties of magnetic thin films, 2) the investigation of the local structure of contaminants in different crown-ethers, soils, colloidal clays and synthetic resins for remediation of contaminated soil at the Savannah River Site, 3) the development of the technique for deconvoluting the LIII and LII spin-polarized EXAFS signals of the 3-d transition metals, 4) the investigation of the local structure of exotic high-temperature superconductors. Characterization techniques include: extended X-ray absorption fine structure spectroscopy, magnetic circular dichroism and magnetic extended X-ray absorption fine structure spectroscopy, X-ray fluorescence, and X-ray diffraction using synchrotron, rotating anode and conventional sources.

**Advisor: Dr. W.T. Elam** *Oct. 1993 - July 1996*

**U. OF NOTRE DAME PHYSICS DEPARTMENT**, Notre Dame, IN 46556

**Title: Research Associate**

#### **Description:**

Designed and developed the first Low-Temperature, Liquid Nitrogen-cycled He-gas-filled TEY EXAFS detector coupled with a three stage goniometer system. Used this detector to investigate the local interfacial structure of new blue-light laser material ZnTe/CdSe. Discovered the formation of high-strained phases at the ZnTe/CdSe superlattice interfaces, contrary to previous strain minimization theory, and developed the new theory to explain these results. Used newly-developed TEY detector to investigate the local atomic structure of thin film Ti Silicides, Fe/Cu superlattices, and  $Ga_xIn_{1-x}As$  thin films. Participated in the design and construction of the UHV Notre Dame Surface Analysis System (NDSAS). Also designed and constructed the parallel electron energy analysis system for NDSAS. Structural characterization techniques include X-ray absorption spectroscopy, X-ray fluorescence, RHEELS, Auger Spectroscopy, X-ray diffraction including the use of a double crystal diffractometer.

**Advisor: Dr. B. A. Bunker** *Jan.1987- Sept. 1993*

**U. OF NOTRE DAME PHYSICS DEPARTMENT**, Notre Dame, IN 46556

**Title: Lab Instructor**

**Description:**

Taught Pre-Med and Introductory Engineering Physics Labs with the aid of a subordinate teaching assistant. Responsibilities include some of the development of new lab classes, administration, and maintenance of undergraduate physics laboratories; preparation and delivery of weekly lectures; homework and laboratory report grading, and one-on-one tutoring sessions.

Sept. 1986- June 1993

**UNIVERSITY OF CINCINNATI PHYSICS DEPARTMENT, Cinn., OH 45207**

**Title: Research Assistant**

**Description:**

Used the Mossbauer Spectroscopy technique to study the chemical environment around Sn atoms in mechanically-annealed NbSn samples. Investigated the correlation of the sample's oxygen concentration to the preparation technique used to create it.

*Advisor: Dr. Punit Boolchand.*

May 1986 - Aug. 1986

### **Awards, Honors, and Activities**

- International Committee for the 11th International Conference on the Biogeochemistry of Trace Elements (ICOBTE) (July 3-7, 2011)
- Secretary to *Envirosynch*, (December 2008-present)
- DePaul University NSF Talent Expansion Program External Advisory Board Member, (October 2008-present)
- Gordon Conference (“Environmental Bioinorganic Chemistry”) invited speaker, 2008.
- Argonne National Laboratory representative to the US DOE BER Environmental Remediation Science Division (2006-2007)
- NSLS (2005-2007) and SSRL (2000-present) Synchrotron General User Proposal Review Committee
- Session Co-convenor of “New applications of synchrotron radiation in Earth and planetary sciences” of the 19<sup>th</sup> General Assembly of the International Mineralogical Association.
- Invited speaker at National Academy of Science: “Frontiers in Soil Science Research,” December 2005.
- Adjunct Professor, U. of Notre Dame, Department of Civil and Environmental Engineering, 2003-present.
- Gordon Conference (“X-ray Physics”) invited speaker, 2005.
- International Scientific Advisory Committee for the Workshop on Speciation, Techniques, and Facilities for Radioactive Materials at Synchrotron Light Sources (Actinide-XAS) (2005-present).
- U. of Notre Dame Center for Environmental Science and Technology Program Advisory Board, 2003-2007.
- Presidential Early Career Award for Scientists and Engineers, 2000.
- Department of Energy, Office of Science Early Career Scientist Award, 2000.
- International Union of Crystallography Young Scientist Award, May, 2000.
- Journal of Synchrotron Radiation Guest Co-editor for International XAFS XI Conference, 2000.
- Visiting Scholar, University of Notre Dame Center for Environmental Science and Technology (1999-2003).
- Originator and Co-organizer of Synchrotron Environmental Science-I&II (SES-I&II) Meetings, Advanced Photon Source, April, 1999 & September, 2001.
- National Research Council Fellow, 1993-1996.
- Graduate Student Teacher of the year (University of Notre Dame Physics Department, 1988).
- Zahm Grant Recipient (University of Notre Dame, 1990).
- Graduate Student Union Grant Recipient (University of Notre Dame, 1989-1992).
- Xavier University Presidential Academic Scholarship (Aug. 1982 - May 1986).

### **Technical Memberships**

American Physical Society, American Chemical Society, American Society of Microbiology, International XAFS Society, American Geophysical Union, American Association for the Advancement of Science, Mineralogical Society of America, American Institute of Physics Forum on Education

### **Productivity Summary**

*(see addendum for total listing of productivity)*

**Papers published in peer-reviewed journals:**

122 in print or in press

**Other science publications:**

44 in print or in press

**Presentations delivered to scientific audiences:**

348 (120 by specific invitation)