YORDANOS BISRAT, DPhil

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EDUCATION

DPhil, Materials Science, **2001**

University of Oxford, Oxford, UK

Thesis: Hertzian Indentation of Glasses and Ceramics (Advisor: Professor Steve Roberts)

B.Sc., Physics, **1993** (*Distinction*)

Department of Physics, University of Asmara, Eritrea

PROFESSIONAL EXPERIENCE

Facility Manager/Research Scientist ***2011- present***

Materials Characterization Facility (MCF), Texas A&M University, USA

Manage day-to-day activities of MCF

- Ensure smooth running of the facility
- Ensure safe work environment by developing occupational health and laboratory safety protocol for the facility including keeping inventory and up-to-date material safety data sheets (MSDS) of hazardous chemicals
- Supervise/Coordinate the acquisition and installation of instruments
- Develop standard operating procedures for various instruments
- Organize open house for both TAMU community and industry, tours to the MCF and demonstrations for classes offered by TAMU faculty
- Organize MCF Lunch Seminar Series

Provide training, imaging and analysis to TAMU researchers and industrial clients, and ensure the proper operation and maintenance of various instruments

- Scanning Electron Microscope (SEM)
- Energy Dispersive Spectroscopy (EDS)
- Time-of-flight (TOF) in Focused Ion Beam Microscope (FIB)
- Dielectric Spectrometer
- Thermomechanical Analyzer (TMA)
- Hot Disk for thermal conductivity

Associate Research Scientist ***2008 – 2010***

Materials Characterization Facility (MCF), Texas A&M University, USA

- Provided training on Scanning Electron Microscope (SEM), Energy Dispersive Spectroscopy (EDS), Atomic Force Microscope (AFM), Dip-Pen Lithography (DPN), class 1000 clean room
- Provided SEM, EDS, AFM services including sample preparation, imaging and analysis to TAMU researchers and industrial clients and co-authored research papers

TECHNICAL SKILLS

- Focused Ion Beam (FIB)
- Scanning Electron Microscopy (SEM)
- Energy Dispersive Spectroscopy (EDS)
- Transmission Electron Microscopy (TEM)
- Atomic Force Microscopy (AFM)
- Indentation (Vickers, Knoop, Hertzian)
- Tensile testing
- 2-point bending
- Powder x-ray Diffraction
- Differential Scanning Calorimetry
- Thermomechanical Analyzer (TMA)
- Dielectric Spectrometer
- Diffraction Surface Refractometry (DSR)
- Thermal conductivity

RESEARCH EXPERIENCE

Postdoctoral Research Associate ***2004 - 2007***

Texas Institute for Intelligent Bio-Nano Materials and Structures for Aerospace Vehicles (TiiMS), Texas A&M University, USA

- Established a novel nanowire fabrication method
- Fabricated and characterized single crystal metallic nanowires
- Investigated electrical and thermal conductivity of carbon nanotube-epoxy nanocomposites
- Mentored undergraduate students and supervised research projects
- Prepared technical reports, presentations and co-authored papers
- Wrote successful research proposals including for the acquisition of polarized light microscope for carrying out fiber-polymer interface studies

Postdoctoral Research Associate ***2000 – 2002***

Department of Materials Science and Engineering, University of Sheffield, UK

- Investigated the relationship between composition and mechanical properties of silicate glasses
- Examined glass forming behaviour and crystallinity of iron phosphate glasses for use in vitrification of hazardous industrial and nuclear wastes
- Taught glass-ceramic practical classes to Material Science students

Research Assistant ***July 10 – July 28, 2000***

Oxford Fibre Optic Tools Ltd., UK

- Developed effective and non-destructive ways of stripping off carbon coatings of optical fibers used for optical gratings
- Investigated the effect of carbon coating of optical fibers on their breaking strength

Research Assistant ***July 9 - Aug.15, 1997***

Cookson Matthey Technology Centre, UK

- Investigated the development of lead-free enamel for the automotive industry
- Evaluated the stress profile at a glass-enamel interface that arises due to differences in coefficient of thermal expansion

AWARDS

1999 ***Young Scientist Award*** in recognition for the best paper presented at the European Materials Research Society (EMRS) meeting held in Strasbourg, France

1998 ***'Hetherington' award*** for the best 2nd year presentation from the Department of Materials, University of Oxford (awarded to one graduate student each year)

1996 – 1998 **'Graduate Scholarship'**, Merton College, University of Oxford

1996 – 1999 **Overseas Research Students Award**, University of Oxford

1993 '**Outstanding student award**', Department of Physics, University of Asmara, Eritrea

PUBLICATIONS

- Kyung-Min Lee, Timothy J. Herrman , **Y. Bisrat**, and Seth C. Murray, 2014, "Feasibility of Surface-Enhanced Raman Spectroscopy for Rapid Detection of Aflatoxins in Maize" *J. Agric. Food Chem., 62* (19), 4466.
- C.-K. Liang, S. V. Verkhoturov, **Y. Bisrat**, S. Dikler, J. D. DeBord, F. A. Fernandez-Lima, E. A. Schweikert, S. Della-Negra, 2013, "Characterization of individual nano-objects with nanoprojectile-SIMS" *Surf. Interface Anal.*, 45, 329.
- Thakre, P., **Bisrat, Y**., Lagoudas, D., 2010, "Electrical and Mechanical Properties of Carbon Nanotube- Epoxy Nanocomposites", *J. App.Poly.Sci.*, 116 (1), 191
- Pinnick, T., Verkhoturov, V., Kaledin, L., **Bisrat, Y**., Schweikert, A., 2009, "Molecular Identification of Individual Nano-Objects" *Anal. Chem.*, 81 (18), 7527
- Lagoudas D.C., Thakre P.R., **Bisrat, Y**.,"Electrical Conductivity of SW and XD-CNTs Reinforced Epoxy Matrix Nanocomposites", ASME Proceedings of Conference on Smart Materials, Adaptive Structures and Intelligent Systems, Ellicott City, Maryland, October 28-30, 2008.
- Seidel, GD., **Bisrat, Y**., Lagoudas, D., 2007, "Electrical and thermal conductivities of carbon nanotube-epoxy composites: Modelling and characterization", *Proceedings of IMECE2007*, Vol 1., 245
- **Bisrat, Y**., Luo, Z., Davis, D., Lagoudas, D., 2007, "Highly-ordered uniform single-crystal Bi nanowires: Fabrication and Characterization", *Nanotechnology*, 18 (39), 395601.
- Thakre P.R., Lagoudas D.C., **Bisrat, Y**., 2007, Characterization of Thermo-Electric Interface Material with Carbon Nanotubes", MRS Proceedings, Vol. 1056, 1056-HH12-06-FF13-06-GG15-06 doi: 10.1557/PROC-1056-HH12-06-FF13-06-GG15-06.
- Chen, C.-C., **Bisrat, Y**., Luo, Z.P., Schaak, R.E., Chao, C.-G., Lagoudas, D.C., 2006, "Fabrication of single crystal tin nanowires by hydraulic pressure injection", *Nanotechnology*, 17 (2), 367.
- **Bisrat, Y.,** Hand, R.J., 2003, "Refining of potassia-magnesia-baria-silica glasses", *Glass Technol.*, 44(5), 191.
- **Bisrat, Y.**, Kingston, J.G.R., Hand, R.J., 2002, "Relationships between composition and the mechanical properties of silicate glasses", *Glass Technol.*, 43C, 296.
- **Bisrat. Y.**, 2000, "Hertzian Indentation of glass and ceramics", *DPhil thesis*, Department of Materials Science, Oxford University, UK.
- **Bisrat, Y.**, Roberts, S.G., 2000, "Residual stress measurement by Hertzian Indentation", *Materials Science and Engineering - A*, 288(2), 148.
- Roberts, S.G., Lawrence, C.W., **Bisrat, Y.**, Warren, P.D., Hills, D.A., 1999, "Determination of surface residual stresses in brittle materials by Hertzian indentation: Theory and experiment", *J. Am. Ceram. Soc*., 82(7), 1809.