

CURRICULUM VITAE

Professor Joshua U. Otaigbe
(*PhD, CEng, FIMMM, CSci, FAEng, FSPE*)

1. GENERAL:**Biodata**

Title: Tenured Full Professor & Group Leader
 Citizenship: United States of America
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School of Polymer Science & Engineering
 The University of Southern Mississippi
 Hattiesburg, MS 39406, USA

2. EDUCATION

Ph.D. (1984) in Polymer Science and Engineering, Univ. of Manchester (UMIST), **England**
B.S. (with Honors) (1979) in Industrial Chemistry, Univ. of Benin, **Nigeria**
Post-Graduate Certificate (2017) in Business Foundations in management, accounting, marketing and finance, The University of Southern Mississippi, College of Business.

PROFESSIONAL ENGINEERING AND SCIENCE REGISTRATIONS

- **CEng**, Registered Chartered (professional) Engineer, **United Kingdom**, 2005 (member #554964)
- Passed the Fundamentals of Engineering subjects (FE) exam (1996) **USA** (certificate #13132)
- Registered professional member of the Nigerian Society of Engineering, 2016
- **CSci**, Registered Chartered (professional) Scientist, 2004, **United Kingdom**

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS (selected)

- The Materials Research Society
- American Institute of Chemical Engineers
- Society of Rheology
- Society for the Advancement of Materials and Process Engineering (SAMPE)
- The Institute of Materials, Minerals & Mining
- Society of Plastics Engineers
- American Chemical Society

HONOURS AND AWARDS RECEIVED (selected)

- Fellow, Academy of Engineering (**Nigeria**), 2016
- Fellow, Society of Plastics Engineers, **USA**, 2005
- Fellow, Institute of Materials, Minerals and Mining, **United Kingdom**, 2002
- Fulbright-Tocqueville Distinguished Chair Award in Engineering in **France** for 2013–2014
- U.S. National Science Foundation CAREER Award, 1997
- U.S. NSF Advisory Panel member for Science and Technology Center program, 2001
- The Cooper Distinguished Lectureship Award by GOMD of American Ceramic Society, 2010
- Selected as an Honored Member in Who's Who of American Inventors, 1998-1999
- Visiting Professor (*invited*), Department of Materials, ETH-Zurich, Zürich, **Switzerland**, 2003 (subsequent visits in 2003-2007).

- Visiting Professor (*invited*), French Engineering University – Institut National des Sciences Appliquées (INSA) de Lyon, Polymer Materials Engineering, Lyon, **France**, 2009
- Visiting Professor (*invited*), Université Jean Monnet, Faculté de Sciences et Techniques, Polymer Materials Engineering, Saint Etienne, **France**, 2012
- Visiting Professor (*invited*), University of Lyon, Polymer Materials Engineering Laboratory UMR 5223, Lyon, **France**, 2014
- Elected to the Board of Directors, Society of Plastics Engineers–Engineering Properties & Structure Division, 2001.

3. PROFESSIONAL EXPERIENCE

Sphere of Practice:

- Academia (university level research and education; university / industry partnerships)
- Industry (advanced materials engineering including composites, polymers, glasses and ceramics; nanotechnology)
- Private Sector (e.g., materials engineering, process engineering, chemical engineering, oil and gas sectors)
- Research Institution (U.S. National Government Laboratories such as U.S. Dept of Energy-Ames Laboratory & Sandia National Laboratory)

2002 – Date Full Professor (*with tenure*) of Polymer Science & Engineering, School of Polymers and High Performance Materials, **The University of Southern Mississippi**, Hattiesburg, MS. (www.usm.edu)

Accomplishments include:

- Provide *leadership for the establishment of the polymer engineering* degree curricula at The University of Southern Mississippi.
- *Teach and conduct research activities* in various aspects of polymer engineering and materials science.
- *Mentor students and junior faculty.*
- *Secure external funding* for research and sponsored programs.
- Assist in preparing the B.S. Polymer Engineering program for ABET accreditation
- Project management

2015–2017 Editorial Board Member for *Scientific Reports*, a journal from Nature Publishing Group, the publishers of *Nature*. (www.nature.com/srep)

Accomplishments include:

- Assess whether manuscripts in the broad area of *chemical physics* should be sent for peer review.
- Manage the peer review of manuscripts in the broad area of *chemical physics* and make final editorial decisions – whether to accept, reject or allow resubmission.
- Act as an advocate for *Scientific Reports*.

2/2014–7/2014 Fulbright-Tocqueville Distinguish Chair in Engineering, Université de Lyon 1, Polymer Materials Engineering, **Lyon, France**
(<http://www.fulbright-france.org/gene/main.php?uni=2&base=322>)

Accomplishments include:

- Provided *leadership for the establishment of U.S.-France Collaboration in Research and Education.*
- Delivered public lectures in a number of French cities including Lyon, St Etienne, and Paris.
- Promoted and reinforced collaborative research between France and the United States in France by developing the latest trends in science & engineering.
- Served in the Final Fulbright Selection committee for French scholars organized by French Ministry of Higher Education and Research and the Franco-American Commission.
- Assisted University of Lyon to develop an international summer school program aimed at international undergraduate students.
- *Developed U.S.-France collaborative research & education project proposal* simultaneously submitted to the NSF and French National Research Agency for Science (ANR) Projects for funding consideration.

6/2012–8/2012 Visiting Professor (*invited*), **Université Jean Monnet**, Faculté de Sciences et Techniques, Polymer Materials Engineering, **Saint Etienne, France** (<http://portail.univ-st-etienne.fr/>)

Accomplishments include:

- Provided leadership for the establishment of U.S.-France Collaboration in Research & Education.
- Co-Examiner of PhD dissertation for French students
- Presented Graduate seminars and lectures in polymer engineering & materials science
- Secured external funding for research and international students exchange visit between France & USA
- Assisted in technical & English Language editing of students and collaborators' manuscripts & reports.
- Mentor French students, postdocs and junior faculty
- Co-authored joint publications in archival science & engineering journals.

2009 – 2010 Visiting Professor (*invited*), **Institut National des Sciences Appliquées (INSA) de Lyon**, Polymer Materials Engineering, Villeurbanne, **France** (*on Sabbatical Leave*) (www.insa-lyon.fr)

Accomplishments include:

- Provided leadership for the establishment of U.S.-France Collaboration in Research & Education
- Co-Supervised Masters Thesis of French student (Mr. Pierre-Yves Paslier)
- Co-Examiner of PhD dissertations for French students
- Delivered graduate seminars and lectures in polymer engineering & materials science
- Secured external funding for research projects and international students exchange visits between France & USA
- Assisted in technical & English Language editing of students and collaborators' manuscripts and reports.
- Mentored French students, postdocs and junior faculty
- Co-authored joint publications in archival science & engineering journals.

5/2003-8/2003 Visiting Professor (*invited*), Polymer Physics, Institute for Polymers, **Swiss Federal Institute of Technology (ETH-Zurich)**, Zurich, **Switzerland**. (Subsequent visits in summers of 2004-2007). (www.mat.ethz.ch)

Accomplishments include:

- Provided leadership for the establishment of U.S.-Switzerland Collaboration in Research & Education
- Co-Supervised PhD project of Swiss student (Mr. Martin Heggli)
- Delivered graduate seminars in polymer physics & engineering, and materials science
- Secured external funding for joint research projects and international students exchange visits between Switzerland & USA
- Mentored Swiss students, postdocs and junior researchers
- Co-authored joint publications in archival science & engineering journals.

1994 – 2002 Assistant Professor / Associate Professor (*with Tenure*) of Materials Science & Engineering, Assistant Professor / Associate Professor (*with Tenure*) of Chemical Engineering, Materials Science & Engineering Dept. and Chemical Engineering Dept., **Iowa State University**, Ames, Iowa
Associate Scientist, **USDOE Ames Laboratory** and **Center for Crops Utilization Research**, Iowa State University, Ames, Iowa. Associate Scientist, Center for Crops Utilization Research, Iowa State University, Ames, Iowa (www.iastate.edu)

Accomplishments include:

- Developed and taught several undergraduate and graduate level courses such as polymers and composites, deformation processing, polymer processing, materials engineering design, introduction to materials science for engineers, and materials for aerospace applications.

- Integrated plastics and polymer engineering courses into the undergraduate and graduate engineering curriculum at Iowa State.
- Provided consulting services to plastics processors and end-users in Iowa.
- Supervised a group of students and research associates working on various projects that were conceived by me in the general area of polymer engineering and materials science.
- Provided direction, focus, resources, and for generating original research ideas for students and research associates working in the polymers and composites research group.
- Initiated and sustained long-term industrial research partnership between Iowa State University and companies such as Huntsman Corporation in Virginia and Arnold Engineering Company in Illinois.
- Developed and taught the first ever polymers and composites course over the Iowa Communications Network (a state owned fiber optic network) to off-campus students in Iowa Industries, and presented many invited talks to my off-campus peers at technical conferences, companies, etc.

1995–present **Principal Partner, Flaney Associates LLC, USA (www.flaneyassociates.com)**

Accomplishments include

- Consultant to polymer, chemical, and advanced materials companies on the engineering of manufacturing processes and products.
- Provided materials and chemicals expert witness for attorneys and insurance professionals for cases on materials engineering, chemical processes/products, and for issues related to industrial and consumer materials science & engineering.

1992–1994 **Project Leader & Engineer, Corning Incorporated, Corning, New York (<http://www.corning.com>)**

Accomplishments include

- Proposed, planned, coordinated, and controlled major technical projects involving plastics, polymers, glasses, ceramics, composites, etc. In addition, I was responsible for making oral and written presentations to key managers and directors from technical, manufacturing, and marketing divisions of the company.
- Provided corporate-wide consulting services in my area of technical expertise and I earned a strong reputation as the company expert in plastics, polymers and advanced materials product development, processing, and applications.
- Supervised and worked with a team of scientists, engineers and technicians (depending on type of project) to execute several new processes and products research & development projects from laboratory to pilot scale and commercialization. I liaised with internal company manufacturing plant staff and customers and our overseas branches to establish viable research projects, producing project proposals and securing funding where required.
- Managed resources for my project team, selection of appropriate team members, assessment of training needs for my direct assistants, and no loss time due to accidents.

1989–1992 **Research Associate Professor of Chemical & Materials Engineering, Department of Chemical Engineering and Department of Mining, Metallurgy and Petroleum Engineering, Univ. of Alberta, Edmonton, Canada (www.engineering.ualberta.ca)**

Accomplishments include:

- Conducted research projects, secured external funding for research proposals, and taught final year undergraduate chemical engineering and materials engineering students.
- Published research results in technical peer-reviewed journals, industry trade magazines, and technical conferences.
- Maintained a number of mechanical properties testing equipment as well as trained students' users of same.
- *Co-Principal Investigator*, (with Williams, M. C.), **Natural Sciences and Engineering Research Council (NSERC) of Canada Strategic Grant Program**, "Engineered thermoplastic structural materials," 10/91–10/94, \$262,000 (no overheads), 95% effort. NSERC is equivalent to NSF in the U.S.

1984–1989 **Assistant Professor** of Industrial Chemistry, **University of Benin**, Benin, Nigeria.
(www.uniben.edu)

Accomplishments include:

- Developed new undergraduate and graduate level courses in industrial & engineering chemistry, taught these courses, conducted research in the general areas of polymer engineering and science, and supervised graduate students.

TEACHING

Current: Polymer processing, rheology, composites, polymer properties & structure, polymer chemistry,

Previous: Materials science, materials engineering design, mechanical properties, industrial chemistry, colloid science, chemical reaction engineering & chemical thermodynamics, materials (deformation) processing.

Undergraduate courses taught:

Structure and properties of polymers & Composites; Polymer Rheology; Polymer Processing; Polymer Processing Laboratory; Polymer Physics; Introduction to Materials Science & Engineering; Introduction to Polymer Science and Engineering; Materials for Aerospace Applications; Polymers and Composites; Freshman Honors Mentor Program; Ceramic Engineering Design; Introduction to Polymer Processing; Multidisciplinary Engineering Design; Metallurgical Engineering Design; Introductory University Chemistry; General Chemistry I & II; General Chemistry Laboratory. 20) Introductory General Physics I (Mechanics); Introductory General Physics I (Fluids, Heat, Thermodynamics, Electricity); General Physics Laboratory; Topics in Industrial Chemistry (Composites); **Mathematics, chemical thermodynamics, chemical reaction engineering, and polymer engineering. (* Taught to chemical engineering students).*

Graduate courses taught

Structure and physical Properties of Polymers; Advanced Polymer Composites; Polymer Rheology; Polymers and Fiber-Reinforced Polymers & Laboratory component; Deformation Processing. 6) Polymers and Composites; Research

Graduate Students & Postdoctoral Fellows Supervised:

Total: 25 graduate students, 14 postdoctoral fellows, 5 postgraduate scholars.

SERVICE ACTIVITIES (selected)

Outside Institution:

Editorial Board Member for *Scientific Reports*, a journal from Nature Publishing Group, the publishers of *Nature*. < <https://www.nature.com/srep/>>

Elected to the Board of Directors, Society of Plastics Engineers–Engineering Properties & Structure Division, 2001.

NSF Advisory Panel member for Science and Technology Center program

Reviewer of a number of publications for archival journals such as *Journal of Materials Science*, *Chemistry of Materials*, *Macromolecules*, *Polymer*, *Journal of Rheology*, *Rheologica Acta*, *Progress in Polymer Science*, etc.

USM:

Undergraduate Curriculum • Governance Committee • Instrument acquisition committee

RECENT DIRECT EXTERNAL RESEARCH FUNDING (selected):

Total amount of funded proposals approx. **\$11,000,000** (Eleven Million Dollars) since 1995 including over **22 National Science Foundation** competitive contract grant awards from division of materials research (**DMR**), chemical, bioengineering, environmental, and transport Systems (**CBET**), office of international science & engineering (**OISE**), division of industrial innovation & partnerships (**IIP**), and Integrative Graduate Education and Research Traineeship (**IGERT**) programs either as principal

investigator or co-principal investigator. *A complete list of funded research proposals is available upon request.*

<http://www.nsf.gov/awardsearch/simpleSearchResult?queryText=Joshua+Otaigbe&ActiveAwards=true&ExpiredAwards=true>

- *Principal Investigator*, National Science Foundation-IIP 1644677, "I-Corps: Toward commercializing cellulose fiber-reinforced polymer composites," 2016, **\$60,000.00**
- *Principal Investigator*, (with J. Lichtenhan), National Science Foundation-DMR 1360006, "GOALI: Development of Inorganic Phosphate Glass Matrix Nanocomposites Incorporating Nanoscale Polyhedral Oligomeric Silsesquioxanes with Improved Properties," 2014-2017, **\$525,623.00**.
- *Principal Investigator*, National Science Foundation-IIA 1346898, "Catalyzing new international research collaboration in molecular polymer composites reinforced with *in situ* low-Tg phosphate glass fibers," 2014, **\$59,369**.
- *Principal Investigator*, (with Prof. J. Nairn), National Science Foundation-CMMI 1161292, "Collaborative Research: Wood Fiber Reinforced Polymers using Ring-Opening Polymers for Structural Applications," 2012-2015, **\$180,000**.
- *Principal Investigator*, (with W. Jarrett and J. D. Lichtenhan), National Science Foundation-CBET 0752150, "GOALI: New Nanostructured Polyurethane/POSS Hybrid Films With Enhanced Benefits: From Reactive Aqueous Dispersions to Prescribed Film Morphologies and Properties," 2008-2011, **\$391,615**.
- *Principal Investigator*, National Science Foundation-OISE 0405001, "U.S.-Switzerland Cooperative Research and Education: Rheology, Morphology and Modeling of New Inorganic-Organic Hybrid Materials," 2005-2008, **\$83,940**.
- *Principal Investigator*, Office of Naval Research, "Coatings, and Biodegradable and Bioabsorbable Films and Composites," 2004-2006, **\$307,333**.
- *Principal Investigator*, National Science Foundation-DMR 0412001, "International Supplement to NSF-DMR 0317646," 2004-2005 \$20,100, PI. (This grant proposal is to support new partnership and new collaborative project with Institute of Macromolecular Compounds, Russian Academy of Sciences).
- *Co-Principal Investigator*, (with L. Mathias and D. Wicks), National Science Foundation-DMR-0300768 "IGERT-Entrepreneurship at the Interface of Polymer Science and Medicinal Chemistry" 2003-2008, **\$3,916,556**.
- *Co-Principal Investigator*, R.C. Larock and Otaigbe, J.U., Iowa Soybean Promotion Board, "Preparation of biodegradable polymers by admet and cationic polymerization of soybean oil," 4/1998, **\$115,988**.
- *Principal Investigator*, National Science Foundation-DMR 9733350, "Medium range order in polymeric phosphate glasses," 2/1998-8/2001, **\$412,487 plus \$17,500** ISU matching funds, PI. Note that this is a highly competitive CAREER award (only $\leq 10\%$ or 325 grant proposals nationwide are funded).
- *Principal Investigator*, National Science Foundation-DMR 9712688, "Development of polymer bonded magnets," 8/1997-8/2000, **\$351,000 plus \$25,000** ISU matching funds PI. Note that this is a highly competitive "Grant Opportunities for Academic Liaison With Industry" award with peer reviewers from both industry and academia.
- *Co-Principal Investigator*, (with N. O. Egiebor), Alberta Oil Sands Technology and Research Authority (now Department of Energy) of Canada, "Athabasca petroleum coke utilization: coagglomeration with sulfur sorbents for the production of smokeless solid fuels," 10/90-10/91, **\$85,000**.

MAJOR CONSULTING ACTIVITIES (selected):

- Polymer Materials Expert witness, Peter G. Angelos Law Firm (2006-2008)
- Expert Witness on Underground Petroleum Plastic Pipes, Whatley Drake LLC (Law Firm) (2006-1007); Expert Witness, Nyemaster, Goode, Voigts, West, Hansell, & O'Brien, P.C. Law Firm (2001) Consultant on coatings, Dancor, Inc., CA (1998)
- Consultant on development of polymer bonded magnets with improved properties, Arnold Engineering Company, Marengo, IL (1996-2003)
- Expert Witness, Fuerste, Carew, Coyle, Juergens & Sudmeier Law Offices, Dubuque, IA, (1998).
- Consultant of development of Elastomeric microparticles via gas atomization processing, DupontDow Elastomers, Switzerland, 1997

- Consultant of development of polyethylene microparticles via gas atomization processing Huntsman Chemical Corporation, Chesapeake, VA (1998–2002)
- Consultant of polymer compounding, RYKO Manufacturing Company, Grimes, IA, (1997)
- Consultant on materials product development, Frigidaire Company, Webster City, IA, (1996)
- Consultant on materials product development, Square D Company, Cedar Rapids, IA (1996)
- Consultant on materials product development and design of plastic agitator, Maytag Corporation, Newton, IA (1996–97);
- Consultant on polymer processing and product development, Iowa Plastics Technology Center, Waverly, IA (1994–1996)
- Consultant on glass-polymer melt blends technology, silicone release pads for decorating ceramic wares & color filter printing, Corning, Inc., Corning, NY, (1994–1997)
- Consultant on coextrusion of phosphate glass and polymers, Dow Chemical USA, Midland, MI (1994–2000)
- Consultant on development of sulfur sorbents for clean coal, Department of Energy (formerly AOSTRA Ltd), Edmonton, Canada (1989–1992)

RECENT PROFESSIONAL DEVELOPMENT ACTIVITIES (*selected*)

- Completed continuing professional development (CPD) activities offered by the Institute of Materials, Minerals and Mining (UK) that include: Extending technical expertise beyond initial specialization; Re-training in a new technical field; Developing an awareness of compliance issues such as health and safety and control of substances hazardous to health; Developing management and soft skills including finance and accounting, foreign language capabilities, and critical thinking
- Attended and presented technical papers at a number of national and international technical conferences and symposia.

LIST OF PUBLICATIONS (*selected*)

<http://usm.flaneyassociates.com/Publication/publications.htm>