

ROY CROOKS, PH.D. P.E.

SUMMARY

Scientist and Professional Engineer with broad experience in Forensic Engineering and Research and Development, education in Chemistry, Biology, Physics and Materials Science, and Classroom Instruction. Current User at three Federal Labs and two University Labs.

Forensic Engineering: *Consultant* to FORCON International, Richmond, VA. Materials Scientist, Electron Microscopist and Spectroscopist. *Expert Witness* for claims of faulty materials and applications.

Classroom Instruction: More than 500 hours of lecturing experience as an Adjunct Professor in Materials Science at the Naval Postgraduate School (Monterey, CA).

Government Lab Access:

NASA LaRC, Hampton, VA, Advanced Materials and Processing Branch, under a reimbursable Space Act Agreement. Capability for Structure, Processing and Property studies of any material, technical resources and support staff.

Jefferson National Accelerator Facility, Newport News, VA, under a Cooperative Research and Development Agreement, *Industrial User*, materials and processes labs. Specialized instrumentation.

National High Magnetic Field Laboratory, Tallahassee, FL; *Visiting Scientist*, materials research labs. Specialized instrumentation.

User agreements with universities in Virginia, Florida and California.

EDUCATION AND CAREER DEVELOPMENT

Professional Metallurgical Engineer, 2004, Virginia, License No. 0402037657

Ph.D. School of Chemical Engineering, 1982, Georgia Institute of Technology, Atlanta, GA. Minor in Corrosion of Biomaterials. DARPA funding.

M.S. Physical Metallurgy, 1979 (School of Chemical Engineering), Georgia Institute of Technology, Atlanta, GA. More than 30 semester hours in Materials Science, emphasizing microscopy and corrosion. Thesis on superplastic forming. NSF funding.

B.S. Applied Physics, 1976, Georgia Institute of Technology, Atlanta, GA. Broad technical curriculum with 20+ semester hours each in Physics, Biology, Chemistry and Mathematics. Biophysics Option.

PROFESSIONAL EXPERIENCE

Forcon International – Virginia, Ltd, 2013 - present. Consultant to Forcon, Specializing in Materials Science, Forensic Engineering, Instrumental Analysis. Expert in Failure Analysis for Consumer Products, Marine Hardware, Construction Materials.

Black Laboratories, L.L.C., Newport News, VA, *Principal Engineer*, 2004 - present. Company founder and Principal of engineering consulting and research firm. Hiring and supervision of scientists, engineers and support staff. Principal Investigator for DHS USCG IDIQ Contract. Consultant to Jefferson National Accelerator Facility, Fermilab, DESY (Hamburg), and NASA LaRC. Proposal Author and Principal Investigator for twelve R&D grants and contracts on spacecraft alloys, superconducting, accelerator cavities, electrochemistry, thin films, and corrosion-resistant alloys. **DOE, NASA, NASA/NESC, AFOSR, NavAir, CRCF (Commonwealth of VA) and DHS Funding.**

Lockheed-Martin, AS&M, *Senior Scientist and Staff Engineer*, 1994-2004. Studies of aerospace alloys. R&D 100 Award (2001) co-recipient for a new, alloy retrofit to a Lockheed-Martin Fighter Aircraft. High Resolution Microscopy, Spectroscopic Studies of nanomaterials at NASA LaRC and ORNL. **NASA Funding.**

Naval Postgraduate School, Monterey, CA, *Adjunct Professor*, 1990 – 1994, Mechanical Engineering Department. Lecturer for graduate courses in Materials Science, Phase Transformations, Welding and Corrosion. Navy research in metals processing. NavAir research using organosilane coating to avoid E-2C fuel nozzle coking problem. Research on welding methods for NASA Space Shuttle Superlightweight Tank. Thesis advisor and co-advisor for military officer graduate students. NSF Materials Research Science and Engineering Center Reviewer. **NavAir and NASA Funding.**

Rockwell International Science Center, Thousand Oaks, CA. *Member of the Technical Staff*, 1985 - 1990. Processing, deformation and fracture studies of aluminum and nickel alloys. Work at Lawrence Berkeley on coatings for hypervelocity aircraft. Principal Investigator for superplastic alloys. Degradation studies of Space Shuttle main engine bearings. Work at LBL, ORNL. **DARPA/AFML and LBL Funding.**

ARCO Metals Technical Center, Atlantic Richfield Corporation, Arlington Heights, IL. *Research Metallurgist*, 1983 - 1985. Group Leader, Electron Microscopy. Process improvement studies for corporate products: alloys, coatings, and composites. **Internal Corporate Funding.**

Georgia Tech Fracture and Fatigue Research Laboratory, *Graduate Research Assistant*, Atlanta, GA, 1976-1982. Fatigue and fracture studies of Al-Li alloys. Alloy development. Instructor for electron microscopy laboratories. Research at ORNL. **NSF and DARPA Funding.**

Dunn Laboratories, Inc., Atlanta, GA, *Chemist/Technician/Student*. 1974-1976. Wet chemistry, ASTM tests. Assistant to Expert Witness and Professional Engineer studying failures of automotive components.

FORENSIC INVESTIGATIONS

Identification of Source of Gouges in Architectural Plate Glass
FTIR Identification of Alkyd Coating Related to Slip and Fall
FTIR Investigation of Polymer Fracture of a Commercial Product
FTIR and SEM Identification of Contaminants in USCG Aircraft Fuel Tank
Two Cases of TBI due to Steel Component Failures
Through-Hull Transducer Corrosion Failure in Ocean Vessel
High Resolution CT Scan Study of Flaws in USCG Helicopter Part
Corrosion of Steel by Microbiologically Influenced Corrosion
Stress Corrosion Cracking of Brass Components
Investigation of Thermal Breakdown in the European X-ray Free Electron Laser
NASA investigations of Shuttle External Tank Stringer Cracking
Space Shuttle Columbia Accident
NASA LaRC Wind Tunnel Component Failures
NASA Tethered Satellite Loss
Weld Process Development in NASA Space Shuttle Superlightweight External Tank
Turbine Engine Component Failure in USCG Aircraft
Fatigue Failures of USCG Stainless Steel Cables
Civilian Roof and Floor Damage from Airborne Steel Rod
Fatigue Failure of Army Helicopter Rotor Lag Straps
Fracture of Titanium Satellite Mounting Bolts

NATIONAL LABORATORY AFFILIATIONS

Jefferson National Accelerator Facility (JLab) Newport News, VA. – *Industrial User*, Cooperative Research and Development Agreement (with user access), 2006 – present.
National High Magnetic Field Laboratory, Tallahassee, FL – *Visiting Scientist* (with user access), 2007 – present.
National Aeronautics and Space Administration, Langley Research Center, Hampton, VA; *Consultant and Guest User*, Space Act Agreement (with user access and technician support), 2005 - present.
Deutsches Elektronen Synchrotron (DESY), Hamburg, Germany – *Consultant*, deformation effects on superconductivity, (2010), collaboration for SBIR (2009-2010).
Fermilab, Batavia, IL, *Consultant*, metals processing (2009).
Lawrence Berkeley Laboratory, Berkeley, CA, Center for Advanced Materials, *Industrial Fellow* (1989), Electron microscopy studies of coatings for hypersonic vehicle skin materials.
Oak Ridge National Laboratory, Oak Ridge, TN, *Guest User*, 1980, 1988, 2002. Collaborated with scientific staff for studies of aerospace materials and organic nanomaterials.

PUBLICATIONS

Over 40 journal publications in Failure Analysis, Aerospace Materials, High Energy Physics Superconducting Materials and Nanomaterials.