

JIM R. SMITH

10745 Moore Street
Westminster, Colorado 80021
(720) 352-3990
jsmith_colo@msn.com

PROFILE

- **R&D Engineer/Chemist** with a broad physical science background in lasers, spectroscopy, analytical chemistry, and semiconductor materials/devices.
- Experienced in product/process development, prototyping, and applied R&D for *chem/bio-sensors, optical sources, and microelectronics*.
- Thrive in dynamic work environments requiring rapid learning. Strong ability to plan and anticipate risks. Focus on utilizing personal and team strengths to maximize results and strive for excellence in fulfilling project objectives.

TECHNICAL SKILLS AND KNOWLEDGE

Skill and knowledge areas: optoelectronics, CW and pulsed lasers, spectroscopy, thin-film metrology, optics, wet chemistry, device microfabrication, photolithography, vacuum technology, cleanroom protocols, electrical/optical measurements, experimental design, process development, QC/QA, computer-experiment interfacing

Specialized Knowledge: optical-based chemical sensors, luminescence spectroscopy

PROFESSIONAL EXPERIENCE

AlphaSniffer, LLC., Boulder, CO, 2/2007 to 7/2007

Senior Research Chemist – Assisted the development of a laser-based biosensor based on optical interference and surface plasmon resonance. Directed and worked with a graduate student to improve materials and photolithographic processing for microarray construction. Evaluated prototype performance and performed test bioassays of protein and bacterial analytes for potential medical and homeland security applications.

- Optimized transducer surface preparation for functionalization chemistry.
- Acquired capital lab equipment to furnish an empty wet chemistry lab on a very limited budget and set up lab with a minimum of downtime.

Astralux, Inc., Boulder, CO, 2000 to 2006

Senior Research Engineer, 2004 to 2006 – Lead the development of two technologies based on wide bandgap semiconductor materials: 1) UV sources for homeland security applications, and 2) solid-state cathodes for power converters and electron tubes. Company and radiation safety officer. Trained and directed other personnel.

- Developed and optimized process flow for production and mounting of prototype edge-emitting UV laser die based on $\text{Al}_x\text{Ga}_{1-x}\text{N}$ materials.
- Wrote two SBIR proposals that were funded for a total of \$255,000. Made major contributions to two other winning proposals that were funded for \$850,000.
- Developed and maintained collaborations with research partners from university, private sector, and government laboratories.

Research Engineer, 2000 to 2003 – Designed, fabricated, and tested SiC and GaN semiconductor devices including LEDs, diodes, and transistors. Wrote monthly and quarterly progress reports. Supervised a software intern and trained graduate students.

- Upgraded software/hardware for the optical lab, leading to increased productivity.
- Constructed a CL spectrometer by integrating vacuum, thermal, and optical components.

Eltron Research, Inc., Boulder, CO, 1997 to 1999

Research Chemist - Devised, carried out, and interpreted experiments to evaluate and optimize fiber-optic chemical sensors for hydrazine and other basic gases. Developed methods to characterize sensor sensitivity, linearity, response time, and selectivity. Wrote monthly progress reports for an SBIR Phase II contract. Trained/directed technicians.

- Prepared three SBIR Phase I proposals on sensors in addition to laboratory duties.

Trace Minerals International, Boulder, CO, 1996 to 1997

Analytical Chemist - Analyzed trace metals in clinical and water samples using ICP-AES and TOF-MS. In charge of the daily operation of an ICP-AES instrument. Performed other tests including microbiological, chemical, and physical analyses.

- Maintained high sample throughput and ensured QCs were met.

Chemistry Department, University of Colorado, Boulder, CO, 1993-1996

Research Assistant - Conducted experiments to investigate the spectroscopy and dynamics of gas-phase negative ions using various CW and pulsed lasers including a high resolution ring dye laser and an ultrafast Ti:sapphire laser. Analyzed optical spectra and assigned mass spectra. Maintained ion beam and vacuum equipment.

- Installed a CAMAC data acquisition system and interfaced to the experiment.

Sandia National Laboratories, Albuquerque, NM, Summer 1990

D.O.E. Student Fellowship - Helped set up apparatus to monitor a steam explosion.

EDUCATION

M.S. - Physical Chemistry, JILA, University of Colorado

Thesis: High Resolution Threshold Photodetachment Spectroscopy of OH⁻

Advisor: Prof. W.C. Lineberger

B.S. - Chemistry, *Magna Cum Laude*, University of New Mexico

INTERNATIONAL EXPERIENCE

Kagoshima, Japan, 1999 to 2000

- Studied Japanese language and culture.

SELECTED PUBLICATIONS AND PATENT

- 1) A. Bhattacharyya, T.C. Chen, T.D. Moustakas, R.E. Treece, *J.R. Smith*, J.I. Pankove and W.F. Hug, "Deep UV Stimulated Emission by Electron-beam Pumping of Bulk AlGa_nN Alloys", 8th Wide-Bandgap III-Nitride Workshop, Session MP-1.2, Richmond, VA, Sept 29-Oct.1, 2003.
- 2) Jonathan L. Shaw, Randolph E. Treece, Dinesh Patel, Carmen S. Menoni, *Jim R. Smith*, and J. I. Pankove, "Electron Emission From GaN n-p Junctions" *Appl. Phys. Lett.*, **81**, 3076-3078 (2002).
- 3) *J. R. Smith*, J. B. Kim, and W. C. Lineberger, "High-Resolution Threshold Photodetachment Spectroscopy of OH⁻", *Phys. Rev. A*, **55**, 2036-2043 (1997).
- 4) "Biological agent decontamination system and method", Randolph E. Treece, *Jimmy R. Smith Jr.*, and Douglas W. Smith, *pending patent*, application #60/566,356, filed April 28, 2004.