

# JIM R. SMITH

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## PROFILE

- **Product Development and Validation Specialist** for *chem/bio-sensors, optical sources, and microelectronics*.
- Experienced in product validation, project management, prototyping, and applied R&D.
- Broad physical science background in analytical chemistry, spectroscopy, lasers, and semiconductor materials/devices.
- Won proposals for over \$1M in government contracts. Managed personnel, budgets, and resources to ensure successful R&D efforts and new product development.

## TECHNICAL SKILLS AND KNOWLEDGE

Skill and knowledge areas: UV/VIS and laser spectroscopy, optoelectronic components, CW and pulsed lasers, optical measurements, gas delivery systems, vacuum technology, instrument repair/calibration, wet chemistry, cleanroom protocols, QC/QA, process development, experimental design, computer-experiment interfacing, Matlab

Specialized Knowledge: optical-based chemical sensors, luminescence spectroscopy

## PROFESSIONAL EXPERIENCE

Established Instrument Manufacturer, Boulder branch, Boulder, CO, 2007 to present

**Senior Scientist** - Assisted in the development of optoelectronic technology and instrumentation for environmental, industrial, and defense applications. Principal Investigator on an Air Force Phase II SBIR contract.

- Formed validation, QA, and QC processes for a new product line.
- Managed validation team at the Boulder branch to help ensure products met PDD specifications and to achieve successful commercial release.

BiOptix, LLC., (formerly AlphaSniffer, LLC.), [www.bioptix.com](http://www.bioptix.com), Boulder, CO, 2007

**Senior Research Chemist** - Assisted the development of a biosensor based on optical interference and surface plasmon resonance (SPR). Performed validation of bioassays for protein and bacterial analytes for potential medical device and homeland security applications.

- Directed and worked with a graduate student to improve materials and photolithographic processing for microarray construction.
- Optimized transducer surface preparation for functionalization chemistry.

Astralux, Inc., [www.astraluxinc.com](http://www.astraluxinc.com), Boulder, CO, 2000 to 2006

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

- Developed company expertise and instrumentation in a new research area involving bio-decontamination applications and x-ray technologies.
- 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 government laboratories, universities, and industry.

**Research Engineer**, 2000 to 2003 - Designed, fabricated, and tested SiC and GaN semiconductor devices including LEDs, diodes, and transistors. Characterized materials and devices using luminescence spectroscopy. Wrote monthly and quarterly progress reports. Supervised a software intern and trained graduate students in device processing.

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

Eltron Research and Development, Inc., [www.eltronresearch.com](http://www.eltronresearch.com), Boulder, CO, 1997 to 1999

**Research Chemist** - Devised, carried out, and interpreted experiments to evaluate and optimize fiber-optic chemical sensors for detection of ppb levels of 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.

- 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 and maintenance 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 molecular spectroscopy and dynamics of gas-phase negative ions using ion beams and various CW and pulsed lasers including a high-resolution tunable ring dye laser and an ultrafast laser. Analyzed optical spectra and assigned mass spectra.

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

Sandia National Laboratories, Albuquerque, NM, 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<sup>-</sup>

Advisor: Prof. W.C. Lineberger

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

## **SELECTED PUBLICATIONS AND PATENT**

- 1) William F. Hug, D. Reid, A Bhattacharyya, T. D. Moustakas, R. Treece, J. R. Smith and J. I. Pankove, "Status of Deep UV Semiconductor Sources for Laser Induced Native Fluorescence and Resonance Raman Spectroscopy", Invited Paper, 31st Annual Conference of the Federation of Analytical Chemistry and Spectroscopy Societies, Portland, OR, Oct. 3-7, 2004
- 2) M. T. Carter, M. Schwartz, D. R. Mowry, *J. R. Smith*, J. D. Young, J. G. Patel, and A. F. Sammells, "Reversible Evanescent Wave Fiber Optic Sensing of Hydrazines", Proceedings of the 193rd Electrochemical Society Meeting, San Diego, CA, May 3-8, 1998
- 3) *J. R. Smith*, J. B. Kim, and W. C. Lineberger, "High-Resolution Threshold Photodetachment Spectroscopy of OH<sup>-</sup>", *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.