

## Joseph Abate, PhD

### SUMMARY

Sr. Technical Manager, Physicist, Systems Architect/Engineer, Strategic Planner & aggressive business developer with over 25 years of leading the development and manufacture of advanced Opto-mechanical systems and sensor platforms for aerospace & other harsh environments for government commercial & sectors. I am a skilled proposal writer, accomplished project planner, requirements developer with extensive experience in ITAR regulations & EVM and directing both technical and programmatic support for DARPA programs.

### EXPERIENCE

#### **Sr. Advanced Systems Manager**

2019 - Present

*Ball Aerospace, Tactical Solutions - Imaging & Surveillance - Westminster, CO*

- Sr. Advanced Systems Manager: Rapid prototyping for classified advanced LIDAR and Non-Conventional Imaging systems
- Primary assignment is the management of the rapid proto-typing of advanced Laser and other Electro-Optical Sensor Systems to support Ball's NBD efforts.
- Member of the team that plans and coordinates the transition of these systems for both internal and external contact manufacturing.

#### **Sr. Program Advanced Materials EW Dev**

2019 - 2020

*Raytheon Company, Space and Airborne Systems, Advanced Technology Center - Goleta CA*

- Sr. Program Manager: Classified EW programs and Adv. EW Materials & Component R&D; Development & maintenance of strategic plans for EW business growth and their Department Technology Road Map.
- Assignment at Advance EW Techniques was to take over a DARPA program that was without a dedicated PM for over 6 months prior to my arrival and was having both serious budget as well as technical difficulties that were impacting program performance. I worked with IPT leads and finance to reduce the number of cost centers by a factor of 3 (20 from 63) and the complexity of the existing technical approach to put the program on a path to meet all deliverables with a "cost to complete" that was within the program budget.
- Additional assignment was to develop & maintain the strategic plans for the Advanced EW Department and its technology road map. In my 5 months there I opened up two new opportunities, 1: Proposed a plan for adapting many of their existing EW approaches to the needs of the "Space Force" and 2: Developed a plan to integrate optical techniques into their existing EW capabilities to open up several new business opportunities. Their Technology Road Map was somewhat outdated, and I update sections of the road map as I was cleared into more and more of their classified SAP programs.

**Sr. Project Manager & SME – Micro-Systems Tech Office**

2014 - 2019

*DARPA Headquarters - Arlington, VA (on contract to ECS Federal Inc.)*

- Project Manager: Stand-off Ubiquitous Power/Energy Replenishment Power Beaming Demo (SUPER-PBD)
- Supervisors: William Chappell PHD; Director MTO: Joseph Mangano PHD; MTO Program Manager
- Technical Subject Matter Expert (SME): Strategic Technologies Office: Classified Laser; Adv, seeker and sensor systems: Supervisor: Thomas Karr PHD; STO Program Manager
- Project Lead: Manufacturing Gradient Index Lens project. (**MGRIN**): Executed optical lens SWAPC reduction technology development/transfer multi-performer (9) project. Supervisor: Mic Maher; DSO Program Manager
- First DARPA assignment was to turn around a 2-year-old faltering program attempting to reduce the size & weight of the lenses for IR optical sensing systems using new “gradient index” GRIN) Optical materials and fabrication methods. The project was seriously behind schedule & over budget.
- After collaborating with materials scientists and component engineers of the program performers. I redirected the program’s resources, removing 1 poorly performing contractor and focusing on the 3 more promising approaches. We then invested in improving the available modeling & diagnostic capabilities. The project successfully concluded in 18 months, demonstrating & transitioning to industry 3 new GRIN production processes, two going from a TRL- 2 to TRL-5 one to TRL-8.
- Next, I proposed & created a new 2-year project, I was both the Project Manager & Systems Engineer for the project. I put together the industrial contractor team including the: high energy Laser builder, solar-assisted UAV Manufacturer, two Photo Voltaic companies to design custom cells. I oversaw the creation of the Flight Test Plan, Safety Plan and after evaluating potential candidate DOD test sites, negotiated all costs and technical details for the Demonstration at White Sands Missile Range.

**Adjunct Professor Dept. of Physics & Astronomy**

2014 - 2018

*Loyola University - Baltimore MD*

Taught undergraduate Physics and Astronomy courses

**Sr. Photonics Consultant - Space Communications & Navigation (SCaN)**

2009 – 2014

*NASA Headquarters - Washington, DC & Goddard Space flight Center, MD*

- Project Lead, Mission I&T & Ground Station I&T Lead NASA’s Laser Comm. Relay Demo (LCRD) project.
- Developed architectures and strategic plans for NASA’s space communication program.
- Provided Systems Engineering support for NASA’s overall optical communication technology program.
- NASA HQ technical representative on the Lunar Laser Comm Demonstration flight terminal team.
- Coordinated the Optical Comm technical and programmatic interactions amongst NASA Centers
- NASA HQ’s Manager for JPL’s Lunar Laser Comm. back up ground terminal project.
- Over-riding mission was to help the NASA centers overcome some of their individual corporate culture biases, so they could work as a team with a single focus on large programs. I believe my work in this area associated with the highly successful, multi-NASA Center Lunar Laser Comm. Demonstration project (LLCD), validated the impact of my efforts in aiding the NASA technical centers better coordinate their efforts rather than compete (that is to “play nice”) with almost all their partners; and even with themselves. It had a noticeable impact on the program’s overall success, and I received a certificate of appreciation from the Agency for that work.

- As part of that project, and several others during that period, I also provided key system engineering support and expertise in aero-space reliability issues to Goddard, JPL and a few small engineering firms in the DC area.

**Sr. Photonics Consultant & Business Dev**

2010 – 2011

*Fibertek Inc. - Herndon, VA*

Develop strategic plans for LASER business growth in the DOD and NASA sectors

**Director – Gov. Communications Laboratory & Department Head,  
Photonic Applications and Development Dept.**

2000 – 2009

*Bell Laboratories, Lucent Technologies/AT&T - Murray Hill, NJ*

- Assembled & lead department of 75 scientists & engineers that created manufactured high performance & reliability photonics & sensor technologies to address USG problems with full P&L responsibility.
- Successfully delivered multiple technologies enabling HW/SW demonstrations to Boeing, Northrop Grumman, Ball, BAE, NASA & USG IC agencies, with all deliverables on time & on or under budget.
- Grew business from a single customer with < \$3M/year activity to a profitable R&D business, averaging better than \$27M/year each my last 4 years as director, with a diverse base of USG agencies & prime contractors.
- 16 years guiding Bell Labs technical teams innovating & solving challenging DOD, IC & commercial customer R&D problems. Our customers came to us with their hardest & most challenging problems because of our proven on-time delivery record and demonstrated reputation for customer focus. We created many new technological approaches and new optical components that enabled solutions and performance levels that solved the customer's problems.
- Led many highly motivated professional technical teams at Bell Labs and built up an extensive experience base in electro-optical materials & components development, high energy lasers, high power Planar Wave Guide optical comm. amplifier designs and fab for SWAP reduction, optomechanical and communications systems engineering. Under my leadership the Bell Labs Photonics Applications Dept. grew from 5 to over 75 scientists & engineers. We became the recognized leader in high-reliability photonics for space & defense.
- In last 8 years as Director, I was responsible for monitoring and addressing program performance against schedule and financial plans and lead my teams to win over 75 individual government and aerospace contracts totaling more than \$250M.

**Program Manager - Gov. Communications Lab**

1998 - 2000

*Free Space Laser Communications Group*

Led team of scientists & engineers on multiple simultaneous contracts that invented & demonstrated key enabling optical components for high bandwidth free-space optical communications

**MTS (Member of Technical Staff, R&D Team Leader**

1993 –1998

*Free Space Laser Communications Group*

Managed multiple DARPA contracts that lead to the 1st demonstration of an operational laser-driven x-ray lithography point source sub 0.25u stepper at Bell Laboratories

## **TECHNICAL BACKGROUND AND SKILLS**

- System Engineering of Optomechanical Systems.
- Evaluation of materials & components for space & harsh environments
- Nonlinear Optical Materials, Optical coating design and testing
- High energy fiber & solid-state lasers & amplifier design, system engineering and manufacturing.
- Systems engineering for free-space optical communications, sensor and seeker applications.
- High power Planar Wave Guide optical comm. amplifier design and fab for SWAP reduction.
- Laser Power Beaming system design and applications.
- Experience in flight test efforts including test site evaluation, planning, laser & flight safety & airworthiness.
- High-reliability photonics components, materials and Optomechanical systems design and testing.
- CW and pulsed optical damage testing of thin-film dielectric & metal coatings.
- Damage testing of optical and structural bulk materials.
- Laser system and optical component manufacturing and testing techniques.
- Sensor development & sensor networks.
- Laser material processing, NDE techniques.
- High power laser beam propagation theory.
- Optical diagnostics and metrology techniques.
- Additive manufacturing techniques to produce low weight visible and infrared optics.
- EW techniques and system requirements.
- 10 years of Semiconductor Equipment Manufacturing experience.
- Skilled proposal writer, people manager/team builder & business developer.
- Experienced in creating and executing Technological Road Maps to reach specific goals.
- Adjunct Professor and Mentor
- Excellent communication, presentation and computer skills.

## **EDUCATION**

**Ph.D., Physics**  
*University of Rochester*

**M. A. Physics**  
*University of Rochester*

**B. A., Physics**  
*Rutgers, The State University*

Government Program Management Training: Two-week training with COTR at remote secure site

Risk Management in a Project Environment  
*George Washington Univ. School of Business*

Front Line Management  
*Eastman Kodak Continuing Education Center*