W. Joe Thomes

Lightworker Photonics, LLC, 443-377-2691
joe.thomes@lightworkerphotonics.com
http://lightworkerphotonics.com

Professional Experience

25 years of experience with developing optical fiber, photonic laser and optoelectronic technologies and subsystems for space flight and harsh environments for low and high power implementations. Thorough knowledge of manufacturing, packaging, testing and quality requirements.

2026 Co-Owner & Senior Engineer, Lightworker Photonics LLC.

2007–2026 Distinguised Aerospace Instrumentation Engineer, NASA Goddard Space Flight Center (GSFC) Greenbelt MD. Thomes served as a senior member of the Photonics Group, designed, developed, tested and implementented optical, photonic and laser subsystems and components for harsh envionrments and high reliability. Thomes was a contractor for 3 years for MEI and a Civil Servant for 16 years. Core competencies for the 19 year span include:

- **Operations Manager, Photonics Group**
  a. **Production:** Supervised all manufacturing and evaluation of fiber optic assemblies, arrays, and integrated subsystems, conducted concurrently for various programs across multiple laboratories at GSFC. Expertise includes designs suitable for harsh environments, advanced high-power polishing processes for large-core optical assemblies, development of optical fiber array assembly technologies, cryogenic assemblies, and both single and multi-optical fiber thermal vacuum feedthroughs.
  b. **Environmental Testing:** Supervised all optoelectronics development and testing projects and laboratories including: multiple vibration shakers, multiple ambient thermal and thermal vacuum chambers for environmental verification of all requirements including radiation that were housed in five different facilities on campus.
  c. **Laboratories and Facilities compliance:** Responsible for manufacturing, test and quality laboratory verification and qualification equipment for all inspection, test and integration of hardware. Engineered methods of laboratory consolidation to increase efficiency and flow. Established in house calibration in compliance with ANSI Z540.3.
- **Component Expert:**
  a. Senior guidance and leadership on component selection for risk mitigation strategies for challenging implementations of lasers, optoelectornics, optics and fiber optics for multiple missions requiring high transmission, high power and high reliability.
  b. Thorough knowledge of failure modes regarding optoelectric and photonic components integrated for telescopes, communication, spectroscopy, rangers and lidar systems.
- **Primary Development Lead (PDL):** Lead for design/development/implementation of new optical and laser subsystems;
  - **2017-2023 Plankton, Aerosol, Cloud ocean Ecosystem Ocean Color Instrument (PACE OCI)** lead engineer for large core fiber array assemblies: design to integration for the most challenging programs for science requirements,

- **2021-2024** Co-PDL on **Roman Space Telescope** Wide Field Camera for custom optoelectronics and flight optical assemblies. Design, packaging, test and delivery for all flight hardware,
- **2016-2018** Optical lead on **Beam Dithering Unit** laser component and the laser fiber optic feethrough's for **Global Ecosystem Dynamics Investigation** Lidar,
- **2007-2015** Internal lead on design, development, testing and integration of the cryogenic optical fiber assemblies for **James Webb Space Telescope** Integrated Science Instrument Module and integrated at Ball Aerospace and Johnson Space Center,
- **2007-2026** Operational lead supervising hands on activities for optical fiber assemblies production, test and documentation: Lunar Reconnaissance Orbiter, Laser Ranging Mission, ICESat-2 Advanced Topographic Laser Altimeter (ATLAS), Mars Science Lab ChemCam & SuperCam, Interior Characterization of Europa using Magnetometry (ICEMAG), NASA Parts & Packaging Program, Express Logistics Carrier and the Laser Interfrometer Space Antenna .

- DOE Q & DOD TS

2003–2007 Senior to Principal Engineer, Sandia National Labs; Optical Firing Sets.
Principal Investigator for development of high power optical firing sets for the Department of Energy including development of compact high power pulsed lasers and optical system for high reliability subsystems in harsh environments. Responsibilities included the design, manufacture, testing, and refinement of compact, rugged, highly reliable solid-state lasers to enhance their survivability in severe thermal, shock, vibration, and radiation environments.

2000–2003 Post Doctoral Appointee, Lasers, Optics, Remote Sensing, Plasma Sciences: Research covered a broad range of optical materials. Work focused on examining the optical response of undoped and Mg-doped $LiNbO_3$ under high doses of gamma (2 MeV) radiation.

Education

- Bachelors of Science in Physics (with honors) & Mathematics, The College of William and Mary, Williamsburg, VA 1996.
- Ph.D. in Materials Science and Engineering, University of Florida, Gainesville, FL 2000.

Patents

July 31, 2018 Patent number 10036632, "System to perform radio frequency interferometry using optical fiber sensing signal processing techniques", Melanie N Ott, William J. Thomes, Eleanya E. Onuma.

Honors/Awards

2016 NASA Exceptional Technology Achievement Medal
2013 Robert H. Goddard Exceptional Achievement Award
Advanced Exploration Systems Innovation Award
Many NASA Honor Awards for Group Achievements
Many NASA Honor Awards for Project Achievements
Conference Chair of "Optical Technologies for Arming, Safing, Fuzing, and Firing (I, II, and III) SPIE International Symposium on Optics & Photonics, 2005 - 2007
Four Sandia Individual Performance Awards

Related Publications

Justin R Crepp, et al. "Resolving the Young 2 Cygni Runaway Star into a Binary Using ILocater," the Astronomical Journal, American Astronomical Society Voume 169:48 December 2024.

David W. Hughes et al. "Lessons Learned in Designing a Proposed Ultraviolet Sterilization System for Space, Aerospace Vol. 11, No. 538. July 2024.

Brent J. Bos et al. "Vision System for the Mars Sample Return Capture Containment and Return System (CCRS)," Aerospace Vol. 11, Issue 6, June 2024.

Matthew W. Mullin et al. "Technology development of a solid state 266 nm laser for NASA's Dragonfly mission," Vol. 12399, SPIE Solid State Lasers XXXII: Technology and Devices, March 8 2023.

W. Joe Thomes, et al. "Cryogenic fiber optic assemblies for space flight environments: design, manufacturing, testing and integration," SPIE Planetary Defense and Space Environment Applications, Vol. 9981, September 2016.

W. Joe Thomes, John Cavanaugh, Melanie Ott, "Proton radiation testing of laser optical components for NASA Jupiter Europa Orbiter Mission," SPIE Conference on Nanophotonics and Macrophotonics for Space Environments V, Vol. 8164, September 2011.

W. Joe Thomes, Melanie Ott, Richard Chuska, Robert Switzer, Diana Blair, "Fiber optic cables for transmission of high-power laser pulses," International Conference on Space Optics, Proceedings Vol. 10565, October 2010.

William Thomes, Frank LaRocca, Melanie Ott, Xiaodan "Linda" Jin, Richard Chuska, Shawn MacMurphy, Tracee Jamison, "Investigation of hermetically sealed commercial LiNbO3 optical modulator for use in laser/LIDAR space-flight applications," SPIE Optics and Photonics Conference, Nanophotonics and Macrophotonics for Space Environments, Vol. 6713, September 2007

- ✓ NASA missions dates and more extensive publications listing please see resume Melanie N Ott and/or https://www.photonicsarchive.com

- ✓ **Legal Name: William Joseph Thomes, Jr**