



Curriculum Vita for David E. Thomas

Creating access to scientific discovery and exploration

Arizona State University
Mars Space Flight Facility
201 E Orange Mall
Tempe, AZ 85287-6305
David.Thomas@asuep.org
Milolnstitute.org

Revision 2.0
June 12, 2024

Executive Summary

David is dedicated to advancing access to scientific discovery and exploration, currently focused on Space. He is the Executive Director of the Milo Space Science Institute, with the goal of transforming the way we engage in space science and exploration, making missions accessible globally, and enabling more countries to participate in the growing space economy. David has extensive experience in space diplomacy, international relationships, and operational excellence in large-scale, complex initiatives.

A New Space Institute for the New American University

The Milo Space Science Institute, LLC was incorporated July 2019 as an Arizona Limited Liability Company as a wholly owned subsidiary of ASU Enterprise Partners. Led by David since incorporation, the Institute seeks to foster international cooperation in space, sharing costs and risks, and undertaking complex space initiatives that would be impossible for individual entities to pursue alone. David established the model for the Institute based on the following principles:

- *Collaborative Funding*: Milo missions are financed through contributions from participating members, with their level of funding determining their level of involvement. This collaborative funding approach allows members to pool resources for ambitious space endeavors.
- *Coordinating Role*: Milo serves as a coordinating entity, contracting with space industry partners to develop and operate space systems and infrastructure required for missions. It acts as a central hub, facilitating cooperation among members and industry.
- *Promoting growth of the local space ecosystem*: Milo enables its members to leverage their respective space capabilities developed through domestic research and development programs. This synergistic approach harnesses the collective expertise, resources, and space/science culture of participating members.

Capacity Building

David has architected a business model to deploy capacity building programming globally. The workforce development is offered in two themes: Lunar Exploration and Climate Action.

- The *Milo Mission Academy for Climate Action* trains participants to leverage space-enabled data to transform their business models and advance space commerce and planetary stewardship.
- The *Milo Mission Academy for Lunar Exploration* provides hands-on learning and insight into lunar exploration, preparing a pipeline of talent for upcoming missions.
- *A key component of all capacity building programming is integrating students into the workflow and providing applied learning experiences as mentors.* The Milo Mission Academy invites students from previous cohorts to mentor international teams, giving them invaluable leadership experience.

Space Missions

Working with the Milo Chief Scientist and members of the Milo Institute's Advisory Council, David has developed innovative mission models that enable new and non-traditional participants worldwide to directly participate in compelling space science missions. Two current mission examples are:

- *Apophis Pathfinder*: A precursor flyby mission to the potentially hazardous asteroid Apophis, with the primary objectives of increasing knowledge of Apophis' orbit, providing initial geological and compositional data, and estimating its mass.

- *LunaRide*: A mission that enables participants to use lunar surface infrastructure for scientific research and technology demonstrations.

Space Diplomacy

David has created an element of the Milo Institute focused on Space Diplomacy, leveraging the US State Department Strategic Framework for Space Diplomacy and its guiding principles. Among its objectives, the Institute seeks to ensure the United States is a partner of choice for programs that make space more accessible to organizations with mature space flight heritage as well as from those with relatively new, and perhaps growing, space agencies and/or ecosystems.

Ambassador Corps: Milo has cultivated an international team of professionals called Milo Ambassadors to foster in-country engagement on behalf of Milo and its Space Diplomacy objectives. Representing multiple countries and regions, Milo Ambassadors create connections between their work in the space industry, their country or region's space ecosystem, and that of their fellow Ambassadors.

- Regions: Africa, Indo Pacific, Latin America, MENA, North America, UK + Europe
- Countries: Australia, Canada, Ecuador, Morocco, Paraguay, United Kingdom, United States, Zimbabwe
- Metrics: 12 Agreements, 4 projects, hundreds of engagements supporting space diplomacy outcomes

NASA Space Act Agreement: on behalf of ASU, David has signed a Space Act Agreement with the aim of preparing students globally for the increasingly complex and challenging Space related career pathways by providing real-world learning experiences with a focus on lunar exploration. Within the framework of the collaborative agreement, Milo will deploy capacity building programs to engage non-US students in space careers and key skills inspired by NASA Artemis mission and lunar exploration plans. The Milo Institute will focus delivery of programming to students in foreign countries to help make space careers more accessible.

International Relationships and Business Development

David has engaged over 150+ organizations in 40+ countries, establishing trust relationships with representatives in governments, universities, companies, and NGOs to better understand their needs. Working with internal legal counsel, he has established policies, procedures, and legal frameworks necessary to engage in international collaboration.

- *Indo Pacific and East Asia*: Australia, India, New Zealand, Republic of Korea, Singapore, Thailand; 2 contracts awarded, 4 MOUs executed, 1 Ambassador in the region.
- *Latin America*: Brazil, Ecuador, Paraguay, US (Puerto Rico); 2 contracts awarded, 2 MOUs executed, 2 Ambassadors in the region.
- *Middle East and North Africa (MENA) plus Eurasia*: Azerbaijan, Israel, Morocco, Saudi Arabia, United Arab Emirates; 2 awards announced, 2 MOUs executed.

Recent Speaking Engagements

- Meridian Space Diplomacy Forum, April 2024 (Washington, US), Cosmic Cooperation: Space Education and Workforce Development Partnerships.
- Space Symposium, April 2024 (Colorado Springs, US), Education to Workforce Program, Moderator for the International Panel: Multilateral Collaboration on Capacity Building of Education to Workforce.

- Forward Research & Innovation Summit – Research and Space Edition, November 2023 (San Juan, Puerto Rico).
- Indo-Pacific Space and Earth Conference, October 2023 (Perth, Australia).

Profile Summary

Leadership in Complex Environments

During the COVID-19 pandemic, David played a pivotal role in Arizona State University's public-facing response efforts. He designed and built Arizona's largest mass vaccination site in six days, hailed as "a model for the nation" by President Biden. David went on to design, build, and lead operations and logistics for six sites across the state, administering 1.3 million doses in six months. He developed the public deployment model for the COVID-19 test developed by ASU's Biodesign Institute, with over half a million tests administered to the public.

Strategic Growth for Science and Technology

David spearheaded the growth of a non-profit organization to \$60 million in annual revenue. He launched the Aegis Advanced Technologies division, focused on nanotechnology, directed energy, materials, and sensors. Under David's leadership, the Science and Technology (S&T) revenue at Aegis increased 300% to \$10M+, driven by a record number of Small Business Innovation Research (SBIR) and Broad Agency Announcement (BAA) awards. His leadership positioned Aegis as a leader in directed energy diagnostics.

Business Strategies

For ASU, CFDRRC, and Aegis, David developed robust business strategies. His approach was effective in capturing government contracts, achieving an impressive 40%-win rate with new customers and a remarkable 75% win rate with repeat customers. His strategic acumen and implementation of best practices contributed to the organizations' success in securing government contracts.

Global Strategic Partnerships

David places a strong emphasis on cultivating trust relationships and executing legal frameworks with strategic organizations across the globe designed to promote local ecosystem growth and minimize the "brain drain" within the partner's region. His reach extends to the Americas, Asia, Australia and Indo Pacific, Europe and the UK, and MENA regions, representing a diverse network of collaborations and partnerships.

Societal Impact from Technology

David demonstrated a commitment to leveraging technology to impact society. His expertise in research and development, regulatory compliance, and clinical trial support played a pivotal role in bringing an innovative telemedicine solution to market to improve early detection of vision problems in pre-verbal children. He authored several patents related to advanced retinal imaging techniques to improve detection of vision problems.

Work Experience

Executive Director, Milo Space Science Institute at ASU, October 2018 to present

- Executed an extensive discovery process engaging over 150 international organizations in over 40 countries around the globe. Assessed business, social, and cultural factors and demonstrated understanding of key drivers for mature, emerging, and aspiring spacefaring nations.
- The insights gained from this global engagement led to the design of capacity-building programs aimed at advancing workforce and space ecosystems to help partners participate in the space economy.
- Principle architect of the Luna Ride mission, offering international partners the opportunity to deploy payloads to the surface of the Moon.
- Supported development of a dedicated mission that would focus specifically on performing the first- ever close flyby of asteroid (99942) Apophis and feed forward information to other missions.

Director and CEO, ASU Research Enterprise (ASURE), January 2019 – July 2021

- Led the public-facing operations for ASU's COVID Response team, overseeing a team that deployed testing at 72 locations across Arizona and New Mexico. Designed and built Arizona's first mass vaccination site in just six days. The site at State Farm Stadium was hailed by President Biden as a "model for the nation," showcasing operational excellence and agility in response to the public health crisis.
- Oversaw the vaccination operation that administered 1.3 million doses across six locations. This feat involved a personnel pipeline of over 2,000 clinicians and mission-critical functions, supported by over 27,000 volunteers.
- Developed an innovation challenge patterned after the grand challenge model, with 40% of the teams receiving follow-on funding. This initiative led to projects with government, national labs, and industry partners.
- Developed critical messaging and provided thought leadership for an innovative organization existing at the leading edge of transformation, highlighting the ability to mature technology to provide positive impact for customers.

Program Manager of Strategic Programs, Arizona State University, June 2018 – January 2019

- Created sustainable models for a diverse range of programs across the university. One of the notable programs he spearheaded was advancing operations for Arizona State University Research Enterprise (ASURE). In January 2019, he transitioned to ASURE to continue supporting and enhancing its operations.
- Demonstrated strategic vision and commitment to operational excellence, which played a pivotal role in establishing sustainable frameworks for various university programs.
- Leveraged experience and understanding of the university ecosystem to ensure program operations were streamlined, efficient, and aligned with the institution's long-term goals.

Director, CFD Research Corporation, April 2014 – 2018

- Increased annual contract awards by 300% and doubled the proposal win rate through a first principles approach to strategy, capture management, project execution, and customer engagement during the project.
- Launched and managed a Startup Accelerator program designed to commercialize technologies originating from government R&D funding; engaged engineers and scientists in Stage Gate, and Agile processes.

- Led multidisciplinary technical teams developing new battery technology, fuel cell, computational materials, energetics and semiconductors; responsible for catalyzing strategic innovation, technical leadership, project management, and business development.
- Developed Processes and Tools for project management and proposal development, implemented effective Change Management practices to bring cohesiveness and focus on increasing revenue.

Executive Manager / Director / Sr. Scientist, Aegis Technologies Group, 2005 – 2014

- Provided transformational research, development, and business leadership to catalyze business focused on nanotechnology and materials science.
- Launched a R&D division with P&L accountability, IP management, and implementing strategic innovation process.
- Awarded \$10M+ in government contracts in the defense sector to develop innovative technology.
- Led a multi-disciplinary team of engineering and scientific staff working in materials science, energy, nanophotonic devices, and terahertz technologies.
- Forged partnerships with government, university, and industry.
- Led an R&D team achieving the 2014 International Test and Evaluation Association (ITEA) Technical Achievement Award for novel measurement techniques in harsh environments.

NSF Industry/University Center for Biosurfaces (I/UCB) Research Associate, The University of Memphis, 2001 - 2004

- Guided research efforts for a biomaterials research laboratory focused on the analytical detection of biopolymer defects. Responsibilities included project coordination and research on the development of analytical methods.
- Successfully developed a fee-for-service analytical process that has become widely adopted within the orthopedic manufacturing community, demonstrating the ability to translate research into real-world impact.

Research Associate, The University of Tennessee Space Institute, 2002 – 2004

- Advanced a telemedicine tool designed to measure visual acuity in preverbal children, developed image processing algorithms and control systems to detect the need for follow-up eye care.
- Contributed to development of an automated device that addresses the challenges of assessing visual acuity in children who are not yet able to verbalize their experiences.

Manager of Research and Development, iScreen LLC, 1999 – 2002

- Managed research and development efforts for a small startup providing a telemedicine tool to measure visual acuity in preverbal children.
- Navigated the process of obtaining Class II device approval from the U.S. Food and Drug Administration (FDA), providing technical support during clinical trials, technician training, and comprehensive documentation.

Manager of Research and Development, Federal Electro Optics, 1997 – 1999

- Led mechanical engineering and software development in support of a custom LASIK system for research.
- Created comprehensive software control system, integrating and subsystems, including UV laser, mechanical and optical components.
- Patented innovation that improved patient outcomes and advanced the field of vision correction technology.

Research Associate, Los Alamos National Laboratory, 1995

- Performed collaborative research focused on investigating the effects of radiation on fiber optics for the International Thermonuclear Experimental Reactor (ITER) program. This research initiative sought to advance the understanding of radiation-induced phenomena in optical fibers, a component of the ITER's diagnostic systems, which are essential for monitoring and controlling the complex fusion processes.
- Contributed to the development of strategies to mitigate the impact of radiation on fiber optic performance applying expertise in optics, materials science, and radiation effects.

Education

The University of Memphis

- MSc. Physics, Summa Cum Laude, 1996
- BSc. Mechanical Engineering, Magna Cum Laude, 1994

Vanderbilt University

- Strategic Innovation Management Certificate, 2015

Patents

- US 6,561,648, D. Thomas. System and method for reconstruction of aberrated wavefronts.
- US 6,394,999, R. Williams, J. M. Freeman, J. F. Freeman & D. Thomas. Laser eye surgery system using wavefront sensor analysis to control digital micromirror device (DMD) mirror patterns.
- US 6,508,812, R. Williams, J. M. Freeman, J. F. Freeman & D. Thomas. Control system for high-resolution high-speed digital micromirror device for laser refractive eye surgery.
- US 6,523,954, R. Kennedy, J. Bellows & D. Thomas. System and method for eye screening.
- US 6,859,311, R. Williams, B. Callies, D. Thomas, Digital micromirror device having a window transparent to ultraviolet (UV) light.
- US 7,077,521, D. Thomas. System and method for reconstruction of aberrated wavefronts.

Publications

Selected Journal Articles

- R. Chen, J. Song, T. Lin, G. Aizin, Y. Kawano, N. Aoki, Y. Ochiai, V. Whiteside, B. McCombe, D. Thomas, M. Einhorn, J. Reno, G. Strasser, and J. Bird, "Terahertz Detection with Nanoscale Semiconductor Rectifiers", IEEE Sensors Journal, Vol. 13, No. 1, January 2013.
- M. S. Jahan, D. E. Thomas, M. D. Ridley, "Ionizing Irradiation for Sterilization and Modification of Orthopedic Biomaterials," Trans. Tech. Periodicals (2003).
- M. S. Jahan, D. E. Thomas, M. C. King, D. W. Cooke, B. L. Bennett, E. B. Orler, and D. A. Wroblewski, "ESR Study of Radiation-Induced Oxidation in Poly (ester urethane), with and without Nitroplasticizer," NIM B (Beam Interactions with Materials and Atoms) 185 (2001) 351-354.
- R. A. Kennedy and D. E. Thomas, "Evaluation of the iScreen digital screening system for Amblyogenic factors," Can. J Ophthalmology 35 (2000) 258-262.
- M. S. Jahan, D. E. Thomas, D. W. Cooke, and B. L. Bennett, "A Study of Free Radicals in Irradiated/Aged UHMWPE Materials," J. Long-Term Effects on Medical Implants, (2000).

- M. C. Buncick, D. E. Thomas, K. S. McKinny and M. S. Jahan "Structural Changes of UHMWPE Exposed to X-Ray Flux in Electron Spectroscopy for Chemical Analysis Detected by Valence Band and Electron Spin resonance Spectroscopy," Applied Surface Science 156 (2000) 97-109.

Book Chapters

- M. S. Jahan, D. E. Thomas, D. W. Cooke and B. L. Bennett, Effects of Gamma Irradiation on Fluorescence Yield in Scintillating, Wavelength Shifting and Clear Fibers, in Proceedings of the 4th International Conference on Calorimetry in High-Energy Physics, Sept. 19-23 (1993), Isola d' Elba, Italy, (A. Menzione and A. Scribano, Eds.) World Scientific, New Jersey, 1994, pp. 613-617.
- M. S. Jahan, D. E. Thomas, D. W. Cooke and B. L. Bennett, Thermal Recovery of Fluorescence Yields in gamma-Irradiated Scintillating and Wavelength Shifting Fibers in Proceedings of the SciFi93, Oct. 24-28 (1993), Notre Dame, IN, (A. D. Bross, R. C. Ruchti and M. R. Wayne, Eds.) World Scientific, New Jersey, 1995, pp. 441-449.
- H. H. Trieu, W. O. Haggard, R. L. Conta, J. E. Parr, D. E. Thomas, and M. S. Jahan, "Investigation of Free Radicals in UHMWPE Materials Following Irradiation and Aging," Symposium on Characterization and Properties of Ultra-High Molecular Weight Polyethylene, (R. A. Gsell, H. L. Stein, and J. J. Ploskonka, eds.) ASTM (STP 1307), PA, 1998, pp. 109-119.

Technical Publications

- H. H. Trieu, M. S. Jahan, D. J. Buchanan, D. E. Thomas, D. A. Needham, J. P. Rouleau, W. O. Haggard, R. L. Conta, and J. E. Parr, "Relationship Between Free Radicals, Oxidative Degradation, and wear Resistance of UHMWPE Tibial Components," Technical Report Presented at the Annual Meeting of the American Association of Orthopedic Surgeons, Feb. 17-24, 1997, Wright Medical Technology, Inc.

Additional publications include other refereed journal articles as well as 30 papers presented at international conferences (refereed publications), national and regional meetings.

Philanthropic

Part of David's personal mission includes working to enhance the wellbeing of marginalized populations. Contributions have included the launch of a non-profit organization to advance education outcomes in Indigenous Communities in Arizona, mentoring future leaders on the job, tutoring at inner city schools, creating a mentoring program in collaboration with a police department, supporting adoption agencies, participating in outreach efforts to international communities, and providing strategic guidance to charitable organizations.

Interests and Activities

David is avid traveler, amateur photographer, aspiring author, and outdoor enthusiast.

References

- Professor Jim Bell, Jim.Bell@asu.edu
- Scott Smas, Scott.Smas@asu.edu
- Lon Levin, lon.levin@s7v.com

Others available upon request.

David E. Thomas