

Charles Chase
Savannah, GA
818-472-5756
charles@unlab.us



Momentum Space (2021 – Present) **VP Engineering and Special Programs**

- Directed engineering team in the design, production and mission operation of ESPA Grande Class (~350 kg) satellite buses and orbital service vehicles, completing three launches in one year. During operations we deployed cubesat customers to specific orbits, integrated and managed customer hosted payloads including a solar power beaming experiment, and conducted the first on-orbit demonstration of Momentum developed technologies including a plasma thruster that uses water as a propellant and a low-cost flexible roll-out solar array.
- Built and managed a multi-disciplinary vertically integrated team with avionics, propulsion, GNC, mission operations, mechanical, and embedded and mission software departments. Improved organizational structure and engineering processes resulting in a >50% reduction in non-conformances. Designed and implemented a new AI&T build and test sequence that reduced build spans by >30% and resulted in the early identification of problems. Improved test as you fly verification processes.
- Led the development of the primary company business and technical strategy resulting in an expanded customer base and new product offerings. Crystallized company differentiators. Developed associated investor briefings and led discussions with our potential strategic partners and investors. Developed new technology and mission concepts for multiple Government contract pursuits.
- Led Space Development Agency communication and missile warning constellation proposals to build and operate 68 satellites with a potential revenue of ~\$1.5B. As prime, integrated the contributions of six major payload teammates including Optical Communication Terminals, L-Band Link-16, Ka band phased array communication, networking and encryption, and IR Electrooptical tracking and fire control sensors. Developed company pricing and contract strategy and authored the cost volume.

UnLAB Inc. (2018 - Present)

Co-Founder and Director of the UnLAB, a 501(c)(3) non-profit developing advanced technologies and products that are good for people, the biome, and that further human understanding. Captured more than \$2M in grants and executed all required contract, subcontract, pricing, and proposal activities as prime contractor:

- Advising the Commander of Naval Research (Office of Naval Research and Naval Research Lab) on high impact technology investment strategies and actions to improve technology development and transition outcomes. Identified and matured multiple disruptive technologies across many disciplines.
- DARPA/DSO program (QUEST) to generate fluctuation based motive forces using non-reciprocal gyrotropic nanoparticles. Developed force generation implementations and devised an optical levitation experiment to measure predicted forces. (Stanford and Princeton subcontractors)
- Limitless Space Institute Asymmetric Potential Forces to develop and test generation of motive forces from the interaction between vacuum fluctuations (quantum vacuum) and asymmetric nano-structures and potentials such as are found in Resonant Tunneling Diodes. (Technion and UCLA subcontractors).

Lockheed Martin Skunk Works (1986 - 1991, 1994 - 2018)

Founder and Leader of Revolutionary Technology Programs, the organization at the technological front end of the Skunk Works. Set the vision, led, managed, and inspired a world class multi-disciplinary team responsible for the conception, development, and market transition of transformative aerospace and commercial technologies and systems. Transitioned technologies from conception under internal research to operational fielding, with widespread application and continued production. Products under development by my team in 2018 included:

- Novel mission and aerospace vehicle system designs and capabilities
- Engineered materials and systems, metamaterials; thermal, optical, and RF
- Novel particle, neutral, and intelligent wave front beams, we build our own beams
- Plasma based flow control, power, circuit, and other systems
- Adaptive structures and materials, morphing, sense and respond
- Aerodynamic materials, flow control, and associated cutting-edge vehicle design
- Breakthrough power and propulsion, from the here and now to the can't-believe-it's-possible
- Compact Fusion – an elegant and radical new approach that can provide energy for everyone
- Hypersonic systems and materials
- Aware, responsive, communicating and energy-harvesting building façades focused on art and design
- Human potential and wellness; positive and beneficial integrated man-machine interfaces
- RF systems for communication, power transfer and control

Lockheed Martin Senior Tech Fellow, a distinction reserved for the top 0.1% of the technical talent in the corporation. Developed in-depth technical strategies for the corporation and helped solve challenging technical issues on programs. Led corporate wide transformative technology and commercialization teams. Identified and initiated development of a portfolio of products with a potential value of \$100Bs. Worked with the CTO to develop and implement a new approach and organizational structure for transformative technology development.

Led multiple commercialization studies, working with outside consultants to evaluate technology and intellectual property portfolios for commercial opportunities. Defined business cases, market transition strategies, teaming, and product development resource requirements for the 10 top candidates and recommended commercial transition best practices.

Sr Program Manager 100% responsible and accountable for the nuts and bolts technical, financial, and milestone performance of customer and internally funded projects, including recruitment, team building, and contractual, legal and intellectual property considerations. Successfully executed more than 50 customer contracts, meeting all financial, milestone, and technical goals. Experience on full-scale development, conceptual vehicle design, research, technology, and production programs.

Electromagnetic Signature Engineer and Manager

- *Program Manager Signature Management*: contracts and internal research; vehicle design; operational analysis; material, edge, antenna, control effector, inlet, and nozzle design and maturation.
- *Group Engineer Signature Analysis*: Led team responsible for development and maintenance of new computational electromagnetic modeling simulation techniques and design software.
- *Low Observable Research Engineer*: F-117A development and operation, other programs.

Lockheed Martin Space Systems, Group Lead, Electromagnetics (1991 – 1994)

- Supervised group of nine engineers as part of the full-scale engineering development of a multispectral system. Solved major program technical issue that was preventing the program from moving to the next phase.
-

Education: University of California, Berkeley

BS Electrical Engineering and Computer Science - Electromagnetics Concentration

Granted US patents include: “Systems and Methods for Plasma Jets”; “Over-wing Traveling-Wave Axial Flow Plasma Accelerator”, “Aharonov-Bohm Sensor”, “Pyroelectric Power from Turbulent Airflow”, “Cognitive Enhancement through Feedback Control”, “Mask Integrated Physiological Sensor”, and “Systems and Methods of Generating Coherent Matterwave Beams”.

Publication impact: h index = 8

Publications cover wide ranging subjects: aircraft design, plasma systems, electromagnetic materials, neuromorphic computing, physiological devices, quantum devices, etc.

Taught MIT Independent Activity Period class on Advanced Propulsion and Energy (2019, 20, 21, 22)

Winner of the Lockheed Martin *Innovate the Future* contest with “Power from Low Speed Wind”, selected from 670 ideas submitted from across the corporation. Semifinalist in *Buckminster Fuller Challenge* with “Bio-Inspired Morphing” to eliminate design stagnation. *Aerostar* award for signature management technology.

Inspiring and compelling speaker providing keynote talks on interactions, innovation, science and technology to companies, academia, and the government. Examples include Microsoft, Merck, McKinsey, Stanford, MIT, UTEP, and briefings to Secretary of the Air Force, House of Representatives, Under-Secretary of the Navy, DOE, ODNI, DoD Science Advisory Boards, the JASONS, and LM Board of Directors.

Member of Momentus Space Strategic Advisory Group, analyzed the company structure, business, and technologies, providing technical, business, and organizational recommendations and strategies.

Disney Animation Consultant: advised movie production on story, accuracy, look, and feel.

I strive to create an environment of joy and ease so people can flourish, be happy, and do their best work. I believe in unlimited abundance and that we can create the future. I focus on the work and the people, setting and maintaining the vision, and directing the day-to-day execution of projects. I can inspire and influence people to do their best and accomplish great things. We are our interactions, and our collaborators across diverse disciplines and mindsets are essential for our success. I love working with extraordinary people with inherent Go who are driven to do good things and are always moving forward.