

EXECUTIVE PROFILE

**Transformative executive leader and builder of high performing teams.
Proven track record of delivering results in large complex organizations.
Demonstrated excellence in strategic planning and business development.
Passionate commitment to diversity, education and workforce development.**

CAREER HIGHLIGHTS

A distinguished career of individual research accomplishments and ever-increasing leadership responsibilities, including selection to the Federal Senior Executive Service in 2007, appointed as Director of NASA's Langley Research Center in 2015, and selected as the first Executive Director of the Virginia Institute for Spaceflight and Autonomy at Old Dominion University in 2019.

Recent Awards:

- Received NASA's Distinguished Service Medal in 2019
- Received the Presidential Rank Award of Meritorious Executive in 2017.
- Received NASA's Outstanding Leadership Medal in 2005 and 2015.

Enduring Legacy:

- Developed an organizational culture of research, engineering and operations excellence.
 - Institutionalized strategic transformation for improved alignment, efficiency and effectiveness.
 - Created an engaged, transparent and inclusive work environment.
 - Cultivated and nurtured relationships across all sectors of government, industry and academia.
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PROFESSIONAL EXPERIENCE

OLD DOMINION UNIVERSITY— Norfolk Virginia

Executive Director, Virginia Institute for Spaceflight & Autonomy (1 yr) 2019 to Present

Successfully leads the Virginia Institute for Spaceflight and Autonomy (VISA) by growing the entrepreneurial ecosystems for spaceflight and autonomy in the state. Forming industry, academic and governmental partnerships, that leverage the expanding space facilities and growing capability to support advances in satellites and autonomous systems, the sensors they carry and the data they produce.

Key Achievements:

- Established VISA's identity through branding/logo creation, website formation (VISAatODU.org) and social media (VISAatODU) presence.
 - Released Announcement of Opportunity focused on solving a real problem that could uniquely utilize a spaceflight or autonomous system, and selected 3 small Virginia Companies for Phase 1 awards.
 - Partnered with NASA's Committee on Earth Observation Satellites (CEOS), Analytical Mechanics and Associates (AMA), and the Virginia Small Sat Data Consortium (vadatahub.org) to develop "Virginia's Open Data Cube" (data4va.org), providing easily accessible, and useable Landsat data from Virginia, to problem owners and solution providers.
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NASA LANGLEY RESEARCH CENTER — Hampton Virginia

Director (4.5 yrs)

2015 to 2019

Successfully led the overall technical activities, infrastructure, and workforce management of a cutting-edge research center with an average annual budget of \$870M, 3400 employees (civil servants, on-site support contractors and students) and a physical footprint of 764 acres with 189 buildings. Advocated, planned and successfully executed technical advancements from concept development through flight in aeronautics, space, and earth atmospheric science. Ensured that facilities, skills and computational tools keep pace with rapidly evolving technology.

Key Achievements:

- ▶ Advanced understanding of the Earth's atmosphere through successful development and launch into space, of two science instruments measuring the ozone layer and solar radiation balance.
- ▶ Developed aeronautics technology and the potential of commercial supersonic over-land flight with initiation of the X-59 supersonic low boom X-plane flight demonstrator.
- ▶ Developed 700 acre on-site test range for Class D autonomous research and operations (City Environment Range Testing for Autonomous Integrated Navigation - CERTAIN)
- ▶ Led NASA's Orion Crew Capsule Launch Abort System (LAS) through the successful Ascent Abort Flight Test.
- ▶ Accelerated infrastructure revitalization with completion of the 40,000-sf Katherine Johnson Computational Research Facility, and construction of a new 175,000-sf measurement systems laboratory and approval for a new Flight Dynamics Research Facility (Wind Tunnel Complex)
- ▶ Engaged partners, stakeholders, students, and the public with the successful year-long multiple event celebration of NASA Langley's Centennial.
- ▶ Advocated and secured an agency initiative to transform business, management and technical processes using emerging digital and autonomous technologies.

NASA LANGLEY RESEARCH CENTER — Hampton Virginia

Associate Director (1.5 yrs) then Deputy Director (1.5 yrs)

2012 to 2015

Conceived, formulated and executed initiatives to improve the efficiency and increase the effectiveness of life-cycle workforce processes (hiring, training and awards), budget formulation and execution, and technical project management.

Key Achievements:

- ▶ Developed a comprehensive workforce strategy, including civil servants, contractors and students, to optimally determine hiring allocations (avoid stove-piping), meet future skills demands (forward fill versus backfill), increase diversity in both the candidate pool and selection (guard against unconscious bias), and more equitably identify training and awards.
- ▶ Implemented a new efficient approach for collecting and funding cross-center technical capabilities resulting in a standardized, more transparent process with increased senior leadership accountability.
- ▶ Restructured Langley's Project Management Development Program (LPMDDP) to include required competencies and assessment criteria, participant/supervisor self-assessments, and assignment of mentors and developmental opportunities.

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NASA LANGLEY RESEARCH CENTER — Hampton Virginia

Deputy Director (2 yrs) then Director (5 yrs) of Exploration and Space Ops 2005 to 2012

Advocated, planned and executed NASA Langley's complete portfolio of work in support of agency programs in human and robotic space exploration. Major programs supported included the Space Shuttle, Constellation (human lunar exploration), robotic Mars exploration, and the International Space Station.

Key Achievements:

- ▶ Developed a new Mars atmospheric measurement system successfully demonstrated on Mars Science Laboratory mission in 2012.
- ▶ Developed a new Mars lightweight, inflatable heat-shield concept successfully demonstrated at sub-scale (3 meter) earth reentry velocity in 2012.
- ▶ Developed a new hypersonic thermodynamic infrared imaging technique successfully demonstrated on three Space Shuttle re-entry flights in 2011.
- ▶ Successfully managed the first flight test of the Orion Launch Abort System in 2010.
- ▶ Successfully managed the systems engineering and integration of the first successful flight test of the new Ares 1-X launch vehicle in 2009.

NASA LANGLEY RESEARCH CENTER — Hampton Virginia

Project Manager

1996 to 2004

Successfully managed numerous large and complex technology development projects involving multiple NASA centers, industry, other government agencies, and academia.

Key Achievements:

- ▶ Developed new, industry adopted fatigue life analyses, and commercialized new non-destructive evaluation capabilities for aging riveted aluminum aircraft structures.
- ▶ Designed, developed and tested the first all polymer-composite, 40-ft semi-span transport aircraft wing.
- ▶ Developed several new advanced launch vehicle technologies, including the first out-of-autoclave 6ft diameter fuel tank successfully tested at cryogenic temperatures, and under mechanical load.

NASA LANGLEY RESEARCH CENTER — Hampton Virginia

Researcher

1980 to 1996

Progressed from individual researcher, to Group Lead, to Assistant Branch Head, studying the application of advanced composite materials for use in space, with focus on material property degradation in the space environment.

Key Achievements:

- ▶ Significantly advanced the understanding of space environmental effects on composite materials, as evidenced by numerous technical papers and conference presentations (Recipient of SAMPE 1989 Frye-Perry Award for Best Paper on Composites)
- ▶ Developed new experimental measurement capabilities for micro-scale thermal deformations.
- ▶ Served as the technical advisor for several graduate students.

EDUCATION

Ph.D., Engineering Mechanics, Virginia Tech, 1990

Dissertation, Micromechanics Analysis of Space Simulated Thermal Deformations and Stresses in Continuous Fiber Reinforced Composites

M.S., Engineering Mechanics, Virginia Tech, 1980

Thesis, Thermal Expansion of Composites Using Moire Interferometry

B.S., Engineering Science and Mechanics, Virginia Tech, 1978

Honor Societies, Tau Beta Pi and Phi Kappa Phi

Highlights of Continuing Executive Education:

- Congressional Operations, Government Affairs Institute at George Washington University, 2012
 - NASA Senior Executive Service Career Development Program, 2008
 - Management Development Program, Ross School of Business, University of Michigan, 2006
 - Ego Free Leadership, Learning as Leadership, 2005
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BOARDS, COMMITTEES & PROFESSIONAL AFFILIATIONS

Board Member, Eastern Shore Community College (ESCC) 2020 to Present

Board Member, Virginia Aerospace Business Association (VASBA) 2020 to Present

Board Member, National Institute of Aerospace (NIA) 2020 to Present

Board Member, Virginia Commonwealth Center for Advanced Manufacturing, 2012 to 2014

Member, Advisory Board of Virginia Unmanned Systems Center at CIT, 2020 to Present

Member, Expert Panel on "Commonwealth Research and Technology Strategic Roadmap", sponsored by State Council for Higher Education and Virginia Research Investment Committee, 2019

Member, Virginia Governor's Aerospace Advisory Council, 2015 to Present

Member, Committee on "A Blueprint for Growth of the Virginia Aviation and Aerospace Industry", sponsored by Virginia General Assembly Joint Commission on Technology and Science, 2017

Associate Fellow, American Institute of Aeronautics and Astronautics (AIAA), 2018

RECENT NOTABLE PUBLIC RECOGNITION/ENGAGEMENTS

- **Virginia Business**, 100 people to meet in 2020, December 2019
 - **Space Transportation Association**, NASA Langley 2019 and Beyond, July 2019
 - **Hampton Roads Business Journal**, 2019 Inside Business Power List, May 2019
 - **The Daily Press**, OpEd: We must return to the moon (and explore beyond), December 2018
 - **WHRV HearSay Radio Show**, Exploring the Moon and Mars, December 2018
 - **First Flight Society 115'th Anniversary of Powered Flight**, Induction of Katherine G. Johnson into the Paul E. Garber First Flight Shrine, December 2018
 - **Aerospace America**, Interview: Leading NASA Langley, February 2018,
 - **AIAA SciTech Conference**, Digital Natives Leading the Digital Revolution in Design and Knowledge Environments (Panel Moderator), January 2018
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FORMAL PUBLICATIONS

Journals:

1. McManus, H. L.; Bowles, D. E.; Tompkins, S. S.: "Prediction of Thermal Cycling Induced Matrix Cracking". *Journal of Reinforced Plastics and Composites*, Vol. 15, Feb. 1996, pp. 124-140.
2. Bowles, D. E.; and Griffin, O. H., Jr.: "Micromechanics Analysis of Space Simulated Thermal Stresses in Composites, Part I: Theory and Unidirectional Laminates". *Journal of Reinforced Plastics and Composites*, Vol. 10, No. 5, Sept. 1991, pp. 504-521.
3. Bowles, D. E.; and Griffin, O. H., Jr.: "Micromechanics Analysis of Space Simulated Thermal Stresses in Composites, Part II: Multidirectional Laminates and Failure Predictions". *Journal of Reinforced Plastics and Composites*, Vol. 10, No. 5, Sept. 1991, pp. 522-539.
4. Derstine, M. S.; Pindera, M.-J.; and Bowles, D. E.: "Experimental/ Analytical Characterization of Composite Tubes Under Combined Loading". *Experimental Mechanics*, Vol. 30, No. 4, Dec. 1990, pp. 336-344.
5. Bowles, D. E.; and Tompkins, S. S.: "Prediction of Coefficients of Thermal Expansion for Unidirectional Composites". *Journal of Composite Materials*, Vol. 23, Apr. 1989, pp. 370-385.
6. Tompkins, S. S.; Bowles, D. E.; and Kennedy, W. R.: "A Laser Interferometric Dilatometer for Thermal Expansion Measurements of Composites". *Experimental Mechanics*, Vol. 26, No. 1, Mar. 1986, pp. 1-6.
7. Bowles, D. E.; Tompkins, S. S.; and Sykes, G. F.: "Electron Radiation Effects on the Thermal Expansion of Graphite/Resin Composites". *AIAA Journal of Spacecraft and Rockets*, Vol. 23, No. 6, Nov. - Dec. 1986, pp. 625-629.
8. Tompkins, S. S.; Bowles, D. E.; and Kennedy, W. R.: "A Laser Interferometric Dilatometer for Thermal Expansion Measurements of Composites". *Experimental Mechanics*, Vol. 26, No. 1, Mar. 1986, pp. 1-6.
9. Bowles, D. E.: "Effect of Microcracks on the Thermal Expansion of Composite Laminates". *Journal of Composite Materials*, Vol. 18, No. 2, Mar. 1984, pp. 173-187.
10. Bowles, D. E.; Post, D.; Herakovich, C. T.; and Tenney, D. R.: "Moire Interferometry for Thermal Expansion of Composites". *Experimental Mechanics*, Vol. 21, No. 12, Dec. 1981, pp. 441-447.
11. Herakovich, C. T.; Bergner, H. W.; and Bowles, David E.: "A Comparative Study of Composite Shear Specimens Using the Finite Element Method". *Test Methods and Design Allowables for Fibrous Composites*, ASTM STP 734, American Society for Testing and Materials, 1972, pp. 129-151.

Conference Proceedings:

1. Bowles, D. E.; and Davis, J. G. Jr.: "NASA's Program on the Structural Integrity of the Aging Commercial Transport Fleet". *Proceedings of the Flight Safety Foundation 48th International Air Safety Seminar*, Seattle, WA, Nov. 6-9, 1995.
2. Bowles, D. E.; and Connell, J. W.: "High Performance Polymers and Polymer Matrix Composites for Spacecraft Structural Applications". Presented at the World Space Congress, Washington, DC, Aug. 28-Sept. 5, 1992, Paper No. IAF-92-0321.

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3. Bowles, D. E.; Tompkins, S. S.; and Funk, J. G.: "Residual Thermal Stresses in Composites for Dimensionally Stable Spacecraft Applications". Proceedings of the VII International Congress On Experimental Mechanics, Las Vegas, NV, June 8-11, 1992, pp. 1211-1219.
4. Tompkins, S. S.; Funk, J. G.; Bowles, D. E.; Towell, T. W.; and Connell, J. W.: "Composite Materials for Precision Space Reflector Panels". SPIE International Symposium and Exhibition on Optical Engineering and Photonics, Orlando, FL, April 20-24, 1992, SPIE Paper No. 1690-28.
5. Hyer, M. W.; Oleksuk, L. L. S.; Bowles, D. E.: "Designing for Time-Dependent Materials Response in Spacecraft Structures". Proceedings of the Ninth DOD/NASA/FAA Conference on Fibrous Composites in Structural Design, Lake Tahoe, NV, Nov. 4-7, 1991.
6. Bowles, D. E.: "Thermal Stress Analysis of Composites in the Space Environment". Proceedings of the Fifth International Symposium on Materials in a Space Environment, Cannes, France, Sept. 16-20, 1991.
7. Bowles, D. E.: "Micromechanics Thermal Stress Analysis of Composites for Space Structure Applications". Proceedings of the ASME Symposium on the Mechanics of Composites at Elevated and Cryogenic Temperatures, AMD Vol. 118, June 1991, pp. 79-90.
8. Tompkins, S. S.; Bowles, D. E.; Funk, J. G.; Lavoie, J. A.; and Towell, T. W.: "The Development of Composite Materials for Spacecraft Precision Reflector Panels". Proceedings of SPIE Conference on Composite Materials for Optical and Electro-Optical Instruments, Orlando, FL, Apr. 16-20, 1990, Vol. 1303. pp. 512-523.
9. Derstine, M. S.; Pindera, M.-J.; and Bowles, D. E.: "Experimental/ Analytical Characterization of Composite Tubes Under Combined Loading". Proceedings of the SEM Spring Conference, Cambridge, MA, May 28-June 1, 1989.
10. Bowles, D. E.; and Griffin, O. H., Jr.: "Analysis of Thermal Stresses in Polymer Matrix Composites". Proceedings of the 34th International SAMPE Symposium and Exhibition, Reno, NV, May 8-11, 1989, pp. 575-584.
11. Tenney, D. R.; and Bowles, D. E.: "Space Radiation Effects on Dimensional Stability of Composites". Proceedings of the 4th International Symposium on Spacecraft Materials in Space Environment, Toulouse, France, Sept. 6-9, 1988, pp. 133-144.
12. Tompkins, Stephen S.; Bowles, David E.; Slemp, Wayne S.; and Teichman, Louis A.: "Response of Composite Materials to the Space Station Orbit Environment". Presented at the AIAA/NASA Space Station Symposium, Williamsburg, Virginia, Apr. 21-22, 1988, AIAA Paper No. 88-2476.
13. Bowles, D. E. and Shen, J.: "Thermal Cycling Effects on the Dimensional Stability of P75 and P75-T300 (Fabric) Hybrid Graphite/Epoxy Laminates". Proceedings of the 33rd International SAMPE Symposium and Exhibition. Anaheim, California, March 7-10, 1988, pp. 1659-1671
14. Bowles, D. E.; and Tenney, D. R.: "Composite Tubes for the Space Station Truss Structure". Proceedings of 18th International SAMPE Technical Conference, Seattle, WA, Oct. 1986, pp. 414-428.
15. Sykes, G. F.; and Bowles, D. E.: "Space Radiation Effects on the Dimensional Stability of a Toughened Epoxy Graphite Composite". Proceedings of 31st National SAMPE Symposium/Exhibition, Las Vegas, NV, Apr. 1986.

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16. Tenney, D. R.; Sykes, G. F.; and Bowles, D. E.: "Composite Materials for Space Structures". Proceedings of the Third European Symposium on Spacecraft Materials in Space Environment, Noordwijk, The Netherlands, Oct. 1985, ESA SP-232, pp. 9-21.
17. Tompkins, S. S.; Sykes, G. F.; and Bowles, D. E.: "The Thermal and Mechanical Stability of Composite Materials for Space Structures". IEEE/ASM/ASME/SME Space Tech Conference, Anaheim, CA, Sept. 1985, Technical Paper EM 85-979.
18. Bowles, D. E.; Tompkins, S. S.; and Sykes, G. F.: "Electron Radiation Effects on the Thermal Expansion of Graphite/Resin Composites". AIAA 19th Thermophysics Conference, Snowmass, CO, June 1984, AIAA Paper No. 84-1704.
19. Tompkins, S. S.; Bowles, D. E.; and Kennedy, W. R.: "A Laser Interferometer Dilatometer for Thermal Expansion Measurements of Composites". Proceedings of SESA Vth International Congress on Experimental Mechanics, Montreal, Canada, June 1984, pp. 367-377.
20. Tenney, D. R.; Sykes, G. F.; and Bowles, D. E.: "Space Environmental Effects on Materials. AGARD Conference on Environmental Effects on Materials for Space Applications". Toronto, Canada, Sept. 1982, Conference Proceedings No. 327, pp. 6-1 through 6-24.
21. Bowles, D. E.; Post, D.; Herakovich, C. T.; and Tenney, D. R.: "Moire Interferometry for Thermal Expansion of Composites". Proceedings of SESA Spring Meeting, Dearborn, MI, June 1981, pp. 391-399.