Bonnie J. Dunbar (Ph.D., NAE, RSECorr, FRAeS, IAA)

John and Bea Slattery Chair, Professor, Aerospace Engineering (Tenured)
Director, Aerospace Human Systems Laboratory (AHSL)
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EDUCATION

NASA Fellowship: (2001)
Harvard University, Senior Managers in Government, Kennedy School of Government, Cambridge, MA
Doctor of Philosophy: (1983)
PhD Mechanical/Biomedical Engineering, University of Houston, Houston, TX
Master of Science: (1976)
M. S. Ceramic Engineering, University of Washington, Seattle, WA Bachelor of Science: (1971)
B. S. Ceramic Engineering, University of Washington, Seattle, WA

HIGHEST LEVEL TECHNICAL RECOGNITION

2008: Fellow, Royal Aeronautical Society, UK
2006: Fellow, AIAA
2006: Washington State Academy of Sciences (WSAS)
2004: The Academy of Medicine, Engineering, and Science of Texas (TAMEST)
2002: National Academy of Engineering, NAE (Aerospace (1), Biomedical (2))
2001: Royal Society of Edinburgh, Corresponding Fellow, CorrFRSE,– Scotland UK
1996: Academician, International Academy of Astronautics, IAA
1993: Fellow, American Ceramic Society, ACerS

MEMBER, AUTHOR, OR CHAIR: NRC/NAE/IOM STUDIES

2012-2018: Member of the National Academy of Medicine (NAM) Committee on Aerospace Medicine and the Medicine of Extreme Environments (CAMMEE)
2014-2018: Member of NAE Committee on K-16+ STEM Education: LinkEngineering.
2013-2014: Committee Member/Author: *Health Standards for Long Duration and Exploration Spaceflight: Ethics, Principles, Responsibilities, and Decision Framework*, IOM, (April 2, 2014)
12/2010 – 12/2012: Committee Member/Author: *NASA Space Technology Roadmaps and Priorities: Restoring NASA's Technological edge and Paving the Way for a New Era in Space.* (2013) Chaired Panel #4 – life support systems, human health, surface operations, and in-situ resource utilization (ISRU).
2011: *Committee on Human Spaceflight Crew Operations* (2012) Committee Member/Author
2008: *A Constrained Space Exploration Technology Program* (2008) Co-chair with Dr. Ed Crawley/MIT: Co-Author on final report.

ACADEMIC EXPERIENCE

1/2016 to Present: **Texas A&M University Tenured Professor** of Aerospace Engineering, and Director of the Institute for Engineering Education and Innovation, IEEI. Funded by Chancellor's Research Initiative (CRI), NASA NIAC, and NASA Human Research Program (HRP) grants. Organized the IEEI program before transitioning to permanent staff in 2019. Established the Aerospace Human Systems Laboratory (AHSL) and built the Human Partial Gravity Centrifuge Aerospace Engineering Annex to house the NASA developed short arm centrifuge. Engaged in research and modelling related to human systems integration and systems engineering into space, particularly of spacesuits and fluid mechanics in fractional g environments. Designed new Graduate level course: "Bioastronautics – Systems Design for Human Spaceflight". Graduated 3 MS students and one PhD student with 2 PhD students and 2 MS in progress. Service: Chair of the Systems Design and Human Integration (SDHI) group, represent SDHI on the Promotion and Tenure Committee, Senior member of the TAMU VPR's Space Initiative group, and Lead on restoration of the Space Shuttle Simulator (SMS-MB) relocation and restoration effort.

1/2013 to 1/2016: **University of Houston Tenured Professor** of Mechanical and Biomedical Engineering, Founder and Director of UH STEM Center; Director of the Aerospace Engineering Master's Program; Director, SICSA Sasakawa International Center for Space Architecture. SICSA was responsible for design concepts for the Houston EFD Spaceport and for Boeing Space Station Concepts. Developed new course content and taught new course for all Freshmen Mechanical Engineering Students, "Introduction to Engineering". Taught ME Junior Level Honors Materials Science and Engineering course. Moved the Science and Engineering Fair-Houston (SEFH) to UH leadership, becoming the Director in 2013.

NON-PROFIT LEADERSHIP EXPERIENCE:

10/2005-6/2010: President and CEO, **Museum of Flight**. Responsible for ~$18M annual budget and 200 staff operating the largest private air and space museum in the nation. Grew annual STEM outreach programs to >140,000 youth. Founded Washington Aerospace Scholars Program for High School Juniors, and raised >$20M for building Space Gallery and other capital projects. Helped to found the four-year Raisbeck Aviation High School (RAHS) on Museum grounds and served on its Board of Trustees. Member of Governor's Task force on K12 STEM education for the State of Washington.

GOVERNMENT EXPERIENCE (Leadership and Spaceflight)

National Aeronautics and Space Administration (NASA): *JSC, Houston, TX and Washington, DC (27-year history from Flight Controller to Mission Specialist/Payload Commander Astronaut to Senior Executive Service (SES)*

1/2005 – 9/2005 **Associate Director, Technology Integration and Risk Management**, Space Life Sciences Directorate (SLSD/JSC), (Senior Executive Service, SES) Responsible for developing a plan for SLSD technology definition and integration in support of the Vision for Space Exploration (VSE). Represented SLSD as a focal point for technology and engineering best practices. Chaired the SLSD Risk Management panel and functioned as the Directorate Risk Manager.

9/2003 – 1/2005 **Deputy Associate Director, Biological Sciences and Applications (BSA/JSC),** SES Responsible for organizing a new Office and Division for Cellular Biotechnology Research at JSC. Responsible for research grants distributed to over 50 Universities. Responsible for BSA public outreach and processing of all education and outreach activities.

1/1999 – 9/2003 **Assistant to the Director, Johnson Space Center** SES

Lead Center interface to Universities (national and international) and other Federal agencies, such as NRO, NSF, DOD, and NIH, as well as to state and national officials. Responsible for JSC center-wide coordination of external sponsored research. Chaired the Engineering Deans Summit. Directed the University student program for Microgravity Parabolic Flight Experiments.

5/1998 – 1/1999 **Deputy Director, Flight Crew Operations Directorate (FCOD/JSC)** SES Responsible for Astronaut Office and Ellington Field Aircraft Operations

10/1995 – 3/1997 **Assistant Director, Mission Operations Directorate (MOD/JSC),** Responsible for creating, organizing, and chairing the International Space Station (ISS) Training Review Panel. POC for Russian MIR Space Station Technical Specifications.

2/1993 –12/1993 **Deputy Associate Administrator (AA), NASA Headquarters, Code U,** Office of Life and Microgravity Sciences and Applications (OLMSA,), Washington DC: Organized the management team focused on space station research (physical and life sciences), First Deputy AA, responsible for $225M budget for microgravity research and development of Shuttle and ISS payload facilities. Developed ISS payload traffic model: 5 year $1B budget. Co-Chair for the ISS Research Evaluation Group for Space Station reporting to the Vest Committee, chaired by Dr. Charles Vest/MIT.

1987 **Chairman of NASA "Microgravity Materials Science Assessment Task Force" Washington DC** Nation-wide task force to determine materials science research priorities for future on-orbit microgravity research. Plan was integrated into the NASA Strategic Plan for Space Exploration under Dr. Sally Ride. Recommendations from the report resulted in the United States Microgravity Laboratory (USML-1) Spacelab flight on the Space Shuttle which flew in 1992 (I was named the Payload Commander). This flight provided a developmental platform for facilities eventually designed for the International Space Station (ISS), such as furnaces, gloveboxes, and human physiology experiments.

1978-1980 **NASA Mission Control Flight Controller and Systems Engineer**: served as Guidance and Navigation Controller (GNC) for the Skylab space station re-entry in 1979, and as Systems Engineer/Payload Officer/Flight Controller for Space Shuttle STS-1 Payloads.

SPACE FLIGHT EXPERIENCE
MISSION SPECIALIST and PAYLOAD COMMANDER ASTRONAUT

STS 61-A Challenger (October 30-November 6, 1985) **Mission Specialist**: STS-61A/D-1 was the first West German sponsored Spacelab mission--the first to carry eight crewmembers and was also the first in which payload activities were controlled from outside the United States (Oberfafenhoven). More than 75 scientific experiments were completed in the areas of physiological sciences, materials science, biology, and navigation. During the flight, I was responsible for operating Spacelab and its subsystems as well as experiments. Mission training included seven months of training in Germany, France, Switzerland, and The Netherlands with crewmembers from Germany and Holland. (Also, EVA Contingency crewmember) Mission duration was 7 days, 44 minutes.

STS-32 Columbia (January 9-20, 1990), **Mission Specialist**: successfully deployed the Syncom IV-F5 satellite, and retrieved the 21,400-pound Long Duration Exposure Facility (LDEF) using the RMS. I was primary operator of the RMS and developed the RMS procedures used for on-orbit photography and protection of LDEF from the atomic oxygen plume. Also operated a variety of middeck experiments, including the Microgravity Disturbance Experiment (MDE) using the Fluids Experiment Apparatus (FEA), Protein Crystal Growth (PCG), American Flight Echocardiograph (AFE), Latitude/Longitude Locator (L3), Mesoscale Lightning Experiment (MLE), Characterization of Neurospora Circadian Rhythms (CNCR), and the IMAX Camera. Was principal investigator for the MDE/FEA Experiment. Additionally, numerous medical test objectives, including the in-flight lower body negative pressure (LBNP) device, in-flight aerobic exercise and muscle performance were conducted to evaluate human adaptation to extended duration orbiter missions. Trained and served as EVA Contingency crewmember. Mission was designated as the first "Extended Duration Orbiter, EDO" mission. Duration was 10 days, 21 hours.

STS-50 Columbia (June 25 to July 9, 1992). **Mission Specialist/Payload Commander**; STS-50, the United States Microgravity Lab-1 (USML-1) mission, was dedicated to microgravity fluid physics, materials science, biotechnology, and human physiology. Mission was result of proposal I submitted to the NASA administrator in 1987. Over 30 experiments sponsored by over 100 investigators were housed in the "Spacelab" in the Shuttle's Payload Bay. Included experiments such as protein crystal growth, electronic and infrared detector crystal growth, surface tension physics, and zeolite crystal growth. STS-50 experiments served as pathfinders for the facilities now installed on the International Space Station (ISS). Mission duration was 13 days, 19 hours.

STS-71 Atlantis (June 27 to July 7, 1995), **Mission Specialist:** was the first Space Shuttle mission to dock with the Russian Space Station Mir, and involved an exchange of crews. The Atlantis was modified to carry a docking system compatible with the Russian Mir Space Station. I served as MS-3 on this flight, which also carried a Spacelab module in the payload bay in which we performed medical evaluations on the returning Mir crew. These evaluations included ascertaining the effects of weightlessness on the cardio/vascular system, the bone/muscle system, the immune system, and the cardio/pulmonary system. Mission duration was 9 days, 19 hours.

STS-89 Endeavour (January 22-31, 1998), **Mission Specialist/Payload Commander:** STS-89 was the eighth Shuttle-Mir docking mission during which the crew transferred more than 9,000 pounds of scientific equipment, logistical hardware and water from Space Shuttle Endeavour to Mir. Included the conduct of 23 technology and science experiments. Delivered Andy Thomas to Mir and returned with David Wolf. As Payload Commander, was responsible for all permission payload training assignments, crew procedures, flight plan activities, communication with MIR during rendezvous/docking/undocking and on-orbit Spacelab operations. Mission duration was 8 days, 19 hours.

BUSINESS/CORPORATE EXPERIENCE

1976 – 1978 **Rockwell International Space Division,** Downey and Palmdale, CA., Senior **Research Engineer, Production Operations** Manufacture of Space Shuttle Columbia Thermal Protection Systems, TPS. "Engineer of the Year" for "distinguished contributions to the development of equipment and processes for the production and repair of the Space Shuttle orbiter's thermal protection system".

1972 – 1974 **Boeing Computer Services (BCS),** Kent Space Center, Kent, WA. **Systems Analyst** Provided Programming, Systems Design, and Analyses in both Cobol and Fortran

INTERNATIONAL EXPERIENCE

5/1976 – 10/1976 **AERE Harwell Laboratories, Oxford, England Visiting Scientist**
Conducted materials research (wetting and surface energy investigations) related to single crystal turbine blade casting technologies sponsored by Rolls Royce.

2/1994 – 3/1995 MIR 25/STS-71 Space Shuttle Crew Training at **Star City Russia** (Preparation to Dock to Russian MIR Space Station on Soyuz Vehicle. Certified in both vehicles and Russian language)

4/1984-10/1985 Space Shuttle STST-61A Crew Training at **DFVLR German Space Center, Cologne, Germany**

CIVILIAN NATIONAL DEFENSE SERVICE and AWARDS

2013-2021	Aerospace Corporation, FFRDC: Board of Trustees (With Clearances)
2018	Air Force 2030 Conference at Texas A&M University: Organizer and Chair for Space Situational Awareness (SAA) Session
1977-2020	Arnold Air Society-Silver Wings Board of Trustees (Elected Emeritus in 2021)
1986	Jimmy Doolittle Fellow, Aerospace Education Foundation of the Air Force Association,
1967-1971	AFROTC Det 910 (University of Washington) Angel Flight: (Elected Flight Commander in 1970)

HONORARY DOCTORAL DEGREES

2016	*Heritage University*, Honorary Degree of Letters, Toppenish, WA
2015	*Rowan University*, Glassboro, New Jersey
2014	*University of Strathclyde,* Glasgow, Scotland,
2002	*University of Dundee*, Honorary Doctor of Engineering, Dundee, Scotland,
2002	*University of Glasgow*, Honorary Doctor of Engineering, Glasgow, Scotland
2000	*Heriot-Watt University* Honorary Doctor of Engineering, Edinburgh, Scotland,
1993	*Clarkson University* Honorary Doctor of Science, New York
1992	*Michigan Technological University* Honorary Doctor of Engineering, Michigan
1991	*Alfred University*, Honorary Doctor of Engineering, New York
1990	*Clemson University*, Honorary Doctor of Laws

OTHER HONORS AND RECOGNITION:

2020 Sigma XI Scientific Research Honor Society John P. McGovern Medal
2019 Non-Resident Fellow, Rice University's Baker Institute of Public Policy, for Space Policy
2018 George R. Stibitz Computer and Communications Award https://engineering.tamu.edu/news/2018/09/dunbar-to-receive-joint-award-from-the-american-computer-robotics-museum.html
2018 Edward O. Wilson Biodiversity Technology Pioneer Award
2016-2018 President, Association of Space Explorers (ASE)
2015 BioHouston Women of Science Award https://xconomy.com/texas/2015/01/23/biohouston-to-honor-female-executives-in-life-sciences-energy-space/
2015 National Academy of Systems Engineering – Omega Alpha Association (OAA) https://omegalpha.org/omega-alpha-full-members/
2013 Elected to Astronaut Hall of Fame
2012 University of Washington College of Engineering Diamond Service Award
2011 American Association of Engineering Societies (AAES) Norm Augustine Award for Outstanding Achievement in Engineering Communications
2009 ASME Ralph Coats Roe Medal
2009 Elected to Living Legends of Aviation, California
2008 Elected to Royal Aeronautical Society (RAeS) Fellow, London, England UK
2007 Washington State Medal of Merit (Governor's Award)
2006 Elected American Institute of Aeronautics and Astronautics (AIAA) Fellow
2005 Society of Women Engineers (SWE) National Achievement Award
2005 ACerS Annual Meeting in Baltimore - Orton Lecture awardee
2005 Arthur Friedberg Award, National Institute of Ceramic Engineers (NICE) Ceramic Engineering
2002 Elected to National Academy of Engineering (NAE)
2001 Elected Royal Society for Edinburgh –Corresponding Fellow, (CorrFRSE), Scotland UK
2001 Awarded NASA Fellowship to Harvard Kennedy School for Government
2000 ACS Engineering Ceramics Div. James I Mueller Memorial Lecture
2000 Women In Technology International (WITI) Hall of Fame
2000 The American Ceramic Society James I Mueller Award
1999 Explorers Club Lowell Thomas Award
1999 NASA Distinguished Service Medal
1998 NASA Spaceflight Medal, STS-89
1997 Rutgers University/Ceramic Association of New Jersey Malcolm G. McLaren Distinguished Lecturer
1996 NASA Distinguished Service Medal
1996 NASA Distinguished Service Award
1995 NASA Spaceflight Medal STS-71, MIR Docking
1995 Flight Achievement Award, American Astronautical Society
1995 Elected International Academy of Astronautics (IAA) Academician
1993 Selected to the US Government Senior Executive Service (SES)
1993 NASA Outstanding Leadership Medal
1993 University of Washington College of Engineering Distinguished Alumna
1993 NASA Exceptional Achievement Medal
1993 Elected Fellow, American Ceramic Society, (Life Member)

1993 Design News Engineering Achievement Award,
1993 IEEE Judith Resnik Award,
1993 SWE Resnik Challenger Medal
1992 Houston YWCA Outstanding Woman in Science and Technology
1992 American Association of Engineering Societies (AAES) National Engineering Award,
1992 Museum of Flight Pathfinder Award,
1992 NASA Spaceflight Medal STS-50
1991 University of Houston, Cullen College of Engineering Distinguished Engineering Alumna
1991 NASA Exceptional Service Medal
1990 American Ceramic Society (ACerS) Karl Schwartzwalter PACE Award,
1990 John McMahon Lecturer, Ceramic Association of New York
1990 NASA Spaceflight Medal STS-32
1989 University of Washington College of Engineering Alumna Achievement Award,
1989 Materials Research Society (MRS) Presidents Award,
1988 Georgia Tech Peter B. Sherry Memorial Lecture in Chemistry,
1988 NASA Exceptional Service Medal
1987 University of Washington Alumna Summa Laude Dignata
1986 Jimmy Doolittle Fellow, Aerospace Education Foundation of the Air Force Association,
1986 Clemson University R. C. Edwards Science and Technology Lecture,
1986 Seattle Evergreen Safety Council Public Service in Space Award
1986 Awarded Life Membership, American Ceramic Society (ACerS)
1985 American Ceramic Society Greaves-Walker Award
1985 NASA Spaceflight Medal 1985
1983 Harry E. Ebright Award, Southwest Section, American Ceramic Society,
1983 Inducted into Tau Beta Pi, National Engineering Honorary
1977 Rockwell International Space Division, Downey, CA., Engineer of the Year

OTHER PROFESSIONAL SERVICE

2006 Washington State Academy of Science (WSAS, Founding Member)
2004 Texas Academy of Medicine, Engineering, Science and Technology (TAMEST, Founding Member)
1999 Founding member of the Scottish Space School, NASA JSC, Glasgow and Strathclyde University
1998 Founder of the NASA Texas Aerospace Scholars (TAS) Program for High School Students

NASA GROUP ACHIEVEMENT AWARDS

1992 CMAM (Spacehab) Source Evaluation Board
1991 Microgravity Disturbance Experiment Team
1985 Shuttle Approach and Landing Team,
1985 STS Spacecraft Mission Support, First DOD mission
1985 Shuttle Avionics Integration Lab (SAIL) Orbiter Flight Test
1983 Shuttle Avionics Integration Lab (SAIL)
1981 Shuttle STS-1 Performance and Analyses Integration Team
1981 Shuttle SAIL Test Team, OV102 Checkout
1980 Skylab Re-entry Team (Guidance and Navigation Office

SELECTED UNCLASSIFIED AND OPEN TECHNICAL PUBLICATIONS

1. *Burke, P., Dunbar, B. J., **"***Development of Computational Fluid Dynamic (CFD) Models of the Formation and Buoyancy-Driven Detachment of Bubbles in Variable Gravity Environments*." 2021 AIAA SciTech Forum, American Institute of Aeronautics and Astronautics. Virtual, January 11-15, 2021. arc.aiaa.org/doi/10.2514/6.2021-1838

2. *Hall, D., Dunbar, B. J., Range of Motion (ROM) "*Analysis for Pressure Garments (EVA and LES) using 3D Photogrammetric Motion Capture, International Conference on Environmental Systems"*, Virtual, July 31, 2020, https://ttu-ir.tdl.org/handle/2346/86475

3. *Dutta, P., *Balcells-Quintana, O., *Viros Martin, A., *Whittle, R., *Josan, P., *Beebe, N., Dunbar, B.J., Wong, R., Diaz-Artiles, A., and Selva, D., "*Virtual Assistant for Anomaly Treatment in Long Duration Exploration Missions",* Invited Paper, AIAA 2020-2255, Published on line 5 Jan, 2020. https://doi.org/10.2514/6.2020-2255

4. Chen, X., Ai, B., Heidari, E, Dunbar, B. J., Sorger, V. J., Wong, Z. J., Chen, R.T., Dalir, H., *Bottom to in- plane grating coupler with high coupling efficiency and directionality,* Proceedings Volume 10917, Terahertz, RF, Millimeter, and Submillimeter Wave Technology and Applications XII SPIE OPTO, San Francisco, CA (2019) https://doi.org/10.1117/12/2510839

5. Dunbar, B. J., Chapates, P.J.; 2019, "*Comparison of 3D Photogrammetric and Laser Hand Scans to Manual Measurement Methods for EVA Glove Fabrication*", Proceedings of the IEEE Aerospace Conference, March 3-8, Big Sky, Montana.

6. Vishala, Scholten, W., *Fernandes, Ralston, Dunbar, B., Hartle, D., *Finite Element Analysis of an Index Finger Flexion in an Extravehicular Activity Glove,* AIAA Modeling and Simulation Technologies Conference, Kissimmee, Florida, January, 2018

7. Greer, M. L., Bering, E. A., Talbot, R., Dunbar, B. J. et al (students*), *The Undergraduate Student Instrumentation Project: A Foray into Instrument Design, Payload Fabrication and Project Management,* 2018 AIAA Modeling and Simulation Technologies Conference, Kissimmee, Florida, January, 2018

8. Yoon, S. Y., & Holtzapple, M. T., & Dunbar, B. J. (2017, June), *Longitudinal Effects of the Foundation Coalition Curriculum on Chemical and Petroleum Engineering Student Performance* Paper presented at 2017 ASEE Annual Conference & Exposition, Columbus, Ohio. https://peer.asee.org/28633

9. Bering A., Gamblin, R, Dunbar, B. J., et al: 2015; "*An Undergraduate Student Instrumentation Project (USIP) to Develop New Instrument Technology to Study the Auroral Ionosphere and Stratospheric Ozone Layer Using Ultralight Balloon Payloads*, AIAA Aviation Forum, AIAA Balloon Systems Conference, 22-26 June, Dallas, TX

10. Arnold, W. A., Wilcox, W. R., Regel, L.L., Dunbar, B. J., *Centrifuge in space fluid flow visualization experiment,* 31st AIAA Aerospace Sciences Meeting and Exhibit, AIAA 93-0467 January 11-14, 1993, Reno, NV

11. Dunbar, Bonnie J, Giesecke, Robert L, Thomas, Donald A: 1991 "*The Microgravity Environment of the Space Shuttle Columbia Payload Bay During STS-32"*, NASA Technical Paper Volume 3141, 51 pages OCLC: 26201280

12. Dunbar, Bonnie J, Thomas, Donald A, Schoess, Jeff N: 1991 "*The Microgravity Environment of the Space Shuttle Columbia Mid-deck During STS-32*", NASA Technical Paper Volume 3140, 59 pages

13. Dunbar, B.J., Nerem, R.M. "*Fracture Toughness of Cortical Rat Femur Bone*", 1983 ASME AMD Symposia Series, Biomechanics Symposium, Applied Mechanical Engineering and Fluids Engineering Conference, Houston, TX Vol 56, Page 213-215

14. Dunbar, Bonnie J. "*Effects of Antiorthostatic Kinesia on Sprague Dawley Rat Femur Fracture Toughness and Concomitant Alterations in Metabolic Activity*", 1983 PhD Dissertation, University of Houston, Cullen College of Engineering, (Advisor: Dr. Robert Nerem (NAE), Chair of Mechanical Engineering)

15. Dunbar, Bonnie J., Editor, Materials Processing in Space, 1983 Proceedings of the American Ceramic Society, Advances in Ceramics, V5, American Ceramic Society, Columbus, Ohio Conference Proceedings from 84th Annual Meeting of the ACerS, May 4-5, 1982. Associate Editor: Esther Lense Publisher

16. Dunbar, B.J., Sarian, S, "*Effect of H2O on Na+ diffusivity in Beta Alumina*", 1977 Solid State Communications, v21, n8, 729-31, Feb. 1977, ISSN 0038-1098 USA

17. Sarian, S, Dunbar, B.J., McIntee, W. J.; "*Effect of Microstructure on Na+ ion diffusion in Beta Alumina*", 1976 Proceedings of 6th International Materials Symposium, Ceramic Microstructures, 1976 UC-Berkley, Aug 24-27, 1976 Westview Press, Boulder, CO. Editors: Richard M. Fulrath and Joseph A. Pask Pages 621-632

18. Dunbar, Bonnie J, "*Kinetics and mechanisms of Na+ transport in single and polycrystalline beta-alumina*" 1975 MS Thesis, University of Washington, Seattle, WA (Advisor, Dr. Suren Sarian, Faculty in Mining, Metallurgical and Ceramic Engineering)

Other (Posters)

1. *Hall, D., Dunbar, B. J., *Modeling of Extravehicular Activity (EVA) Suits using Vitronics Vitus Laser Scanning Coupled with CAD/Vidya Software for Fabric Behaviors*, International Conference on Environmental Systems (ICES), Boston, MA July 2019 (First Place Poster)

2. *Burke, P., *Varnum-Lowry, D., Dunbar, B. J. *Microgravity and Partial Gravity Fluid Physics: Bubble Formation and Movement in Variable Gravity Environments*, International Space Station Research and Development Conference, Atlanta, GA, August, 2019 (First Place Poster)

CERTIFICATIONS:

- Professional Engineer (PE) registered in Texas, No. 89673 (Currently inactive)
- Private pilot, Certificate 3547565 NAUI Scuba Certified (Boeing Seahorses, 1973)
- Greater than 1000 hours in T-38 jets as co- pilot (instrument rated/glass cockpit) (NASA)
- Greater than 100 hours, Co-pilot, Cessna Citation II Jet (NASA)
- Parachute Jump Certified: Royal Air Force, England, 1976

Languages: English, Russian (DLI 3+), some German, French, and Latin

- Ham Radio Amateur Radio License: KD5DCB

PROFESSIONAL MEMBERSHIPS:

- National Academy of Engineers (NAE)
- American Institute of Aeronautics and Astronautics (AIAA) Fellow
- Royal Aeronautical Society (RAS) Fellow
- Royal Society of Edinburgh (Elected CorrFRSE)
- American Ceramic Society (AcerS) Fellow
- National Institute of Ceramic Engineers (NICE)
- National Society of Professional Engineers (NSPE)
- Tau Beta Pi National Engineering Honorary
- Society of Women Engineers (SWE)
- Association of Space Explorers (ASE-Past President of International Executive Committee)
- Materials Research Society (MRS)
- International Academy of Astronautics (IAA) Academician
- American Society of Engineering Education (ASEE)
- Air Force Association (AFA)

TECHNICAL SOCIETY LEADERSHIP ACTIVITIES

2019 Chair, Annual Meeting of the Association of Space Explorers (ASE) Houston, TX
2018: Technical Session Chair, Air Force 2030, Space Situational Awareness (SSA), College Station, TX
2018**:** Chair, The Academy of Medicine, Engineering, and Science of Texas (TAMEST) Conference, "Aerospace in Texas", Houston, TX
2015-2019: International Space Medicine Summit (ISMS) Committee Chair and panel member on exploration health issues, and STEM education
2016-2018 International President, Association of Space Explorers (ASE)
2004 General Chair, STAIF 2004, (Space Technology and International Forum), Albuquerque, NM,
2004 Chair, Human Space Exploration Track, AIAA, Space 2004, San Diego, CA
2000 Space Technology and Applications International Forum (STAIF) Steering Committee
1999 National Engineers Week (NEW) National Steering Committee

1998 DOD TARA Review Committee,
1992 – 1999 NSF Engineering Advisory Committee

SERVICE ON BOARDS, Past and Present:

Lone Star Flight Museum, Board of Directors Aerospace
Corporation Board of Trustees
National Space Biomedical Research Institute (NSBRI) Board of Trustees
The Academy of Medicine, Engineering, and Technology of Texas (TAMEST) Founding Member, Board of Trustees
Washington State Academy of Sciences (WSAS) Founding Board Member
Museum of Flight (MOF) Board of Trustees
Seattle ARCS, Board of Directors, VP of Finance
University of Washington College of Engineering Visiting Committee
Arnold Air Society and Silver Wings (AAS/SW) Board of Trustees
Aviation High School (AHS) Board of Advisors
Washington Aerospace Scholars (WAS) Board of Trustees
Seattle Rotary 4 Board of Trustees AIAA National Board of Directors
American Mechanical Engineering Society Foundation Board of Trustees
Greater Houston Area Red Cross (HARC) Board of Directors