Amrutur .V. ANILKUMAR

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Education:

1983-1988:	Ph.D., Mechanical Engineering and Aeronautics Graduate Aerospace Laboratories, California Institute of Technology, Pasadena, CA – 91125
1982-1983:	M.S., Mechanical Engineering California Institute of Technology, Pasadena, CA – 91125
1977-1982:	B.Tech. Mechanical Engineering Indian Institute of Technology, Madras, India – 600-036

Leadership:

2023-present	Mark Dalton Faculty Director of Experiential Learning in Aerospace Engineering, Vanderbilt University, Nashville, TN 37235, USA
2015-present	Professor of the Practice of Aerospace Engineering, Vanderbilt University
2014-present:	Advisory Guest Professor, Indian Institute of Technology, Gandhinagar, India
2007-present:	Professor of the Practice of Mechanical Engineering, Vanderbilt University
2022-present:	Chair: AIAA Reusable Launch Vehicle Technical Committee
2021-present:	Chair: Dr. V. Ganesan Faculty Fellow Campaign, IIT Madras, India
2022-present:	Co-Founder and Benefactor: Healthcare Access and Innovation Laboratory, (HAIL), Accident Critical Care and Analysis Project (ACCA) at National Institute of Mental Health and Neurological Sciences (NIMHANS), Bengaluru, India.
2017-2018:	Chair: Professor V. Ramamurti Faculty Fellow Campaign, IIT Madras, India
2013-2020:	Chief Organizer: Roddam Narasimha Distinguished Seminar Series, IIT Gandhinagar, India
2011-present:	Director, Vanderbilt-Metro Water Renewable Energy Showcase Facilities
1989-2006:	Research Professor, Center for Microgravity Research and Applications Vanderbilt University, Nashville, TN 37235 NASA Investigator of Microgravity Fluids Phenomenon on Space Shuttle Missions (USML- I; 1992 and USML- II; 1995) and of Materials Processing Phenomenon on the International Space Station (ISSI, PFMI; 2002-2003).
2020-2021:	Educational Committee Chair: AIAA Reusable Launch Vehicle Technical Committee

Honors & Awards:

- **Vanderbilt University Chancellor's Cup**: for the greatest intellectual and academic contributions to undergraduate students outside of classroom teaching (2017). The faculty member's contribution "shall be one of educational importance, relevant to the central purpose of the University." Citation: Amrutur Anilkumar has helped make Vanderbilt an aerospace engineering powerhouse even without a formal program; for his dedication to connecting students across disciplines and advising student groups.
- **AIAA Abe Zarem Educator Award**: National Award; American Institute of Aeronautics and Astronautics (2017). Presented to the faculty advisor of the student winner of the Abe Zarem Graduate Award for Distinguished Achievement in Aeronautics or Astronautics; advisor recognized for his/her role in guiding and mentoring the student.

- **AIAA Faculty Advisor of the Year**: National Award; American Institute of Aeronautics & Astronautics**,** (2016) for passionate promotion of aerospace design activities, community outreach and mentoring of students to success at National Competitions and pursuit of Aerospace Engineering careers.
- **NASA Educational Engagement Awards**: National Awards for best inspiring the study of rocketry and STEM-related topics among younger students and their community (2023, 2021, 2017, 2014, 2012).
- **Faculty Advisor for Northrop Grumman-Orbital-ATK NASA Student Launch National-Championship Teams** for the years 2020, 2019, 2018, 2016, 2015, 2014, 2014, 2013 and National Space Club second place teams of 2017, 2021.
- **Associate Fellow:** American Institute of Aeronautics and Astronautics, AIAA (2012). Awarded to persons who have accomplished or been in charge of important engineering or scientific work, or who have done original work of outstanding merit, or who have otherwise made outstanding contributions to the arts, sciences, or technology of aeronautics or astronautics.
- **AIAA Special Awards:** for designing and executing a comprehensive STEM educational outreach program involving Aerospace Engineering, for sustained and outstanding achievement in Aerospace Engineering, for outstanding mentoring to Aerospace Club (2014, 2012, and 2010).
- **2012 EPA P3 Award** (People, Prosperity, and the Planet): for the quality and design of bio-hybrid solar cells.
- **Paladin Capital Marketplace Innovation Award** (@ EPA's American Innovation for Sustainability Forum in Washington, DC), for the design of the bio-hybrid solar cells.
- **AIAA Faculty Booster Award** for steadfast commitment and outstanding leadership as the faculty advisor of the Vanderbilt University AIAA Chapter (2008).
- **Vanderbilt University School of Engineering Award for Excellence in Teaching** (2007). Award presented by the Dean of Engineering to a member of the VUSE faculty who has made significant contribution to excellence in undergraduate or graduate instruction during the past year. Factors considered are high teaching ratings, course materials, effective innovations in instruction, positive influence on outreach within and external to VUSE, curriculum value, and collaboration with faculty members outside VUSE.

- **NASA Public Service Group Achievement Awards** for outstanding support to the Space Shuttle mission operations (1996), and for outstanding support to the PFMI investigation aboard the International Space Station (2002).
- **NASA certificates** in recognition of outstanding contribution to success of USML-1(STS –50; 1992) & USML-2 (STS-73; 1995) Space Shuttle Missions and the PFMI investigations aboard the International Space Station (ISS; 2004).
- **Member Alpha Sigma Mu**: International Professional Honor Society for Materials Science and Engineering.

Research & Development:

- Reusable Launch Vehicles: Design, Structural Health Monitoring and Flight Load Analysis
- Space Flight Applications: Development of Experimental Facilities for Fluids Experimentation
- Rocket Propulsion: Flight Dynamics and Control, Reaction Control and Monopropellant Thrusters
- Energy and Expert Systems: Off-Terrain Vehicle Lubrication Quality Sensing, Wind Turbines
- Fluid Physics: Drop and Bubble Dynamics, Bio-Encapsulation, Directional Solidification

Patents:

- A Novel Reactor for Making Uniform Capsules,' US Patent 6,001,312 (12/1999), with I. Lacik and T.G. Wang.
- An Encapsulation System for the Immunoisolation of Living Cells,' US Patent 5,997,900 (12/1999), with T.G. Wang, I. Lacik, M. Brissova, and A.C. Powers.

Current Funding:

- GE Dalton Directorship in Aerospace Studies
  2/2023-2/2032; $1,000,000
- Wind & Solar Power generation Installation @ Love Circle
  1/2011-6/2026 ; $124,500

Peer-Reviewed Journal Publications:

1. A.V. Anilkumar, C.P. Lee, and T.G. Wang, 'Surface-tension-induced mixing following coalescence of initially stationary drops,' *Physics of. Fluids* A 3(11), 1991, pp. 2587-2591.
2. C.P. Lee, A.V. Anilkumar, and T.G. Wang, 'Static shape and instability of an acoustically levitated liquid drop,' *Physics of. Fluids* A 3(11), 1991, pp. 2497-2515.
3. A.V. Anilkumar, R.N. Grugel, X.F. Shen, C.P. Lee, and T.G. Wang, 'Control of thermocapillary convection in a liquid bridge by vibration,' *Journal of Applied Phys*ics 73(9), 1993, pp. 4165-4170.

4. A.V. Anilkumar, R.S.J. Sparks, and B. Sturtevant, 'Geological implications, and applications of high-velocity two-phase flow experiments,' *Journal of Volcanology and Geothermal Research* 56, 1993, pp. 145-160.
5. A.V. Anilkumar, C.P. Lee, and T.G. Wang, 'Stability of an acoustically levitated and flattened drop: an experimental study,' *Physics of Fluids* a 5(11), 1993, pp. 2763-2774.
6. T.G. Wang, A.V. Anilkumar, C.P. Lee, and K.C. Lin, 'Core centering of compound drops in capillary oscillations: observations on USML-1 experiments in Space', *Journal of Colloid and Interface Science* 165, 1994, pp. 19-30.
7. T.G. Wang, A.V. Anilkumar, C.P. Lee, and K.C. Lin, 'Bifurcation of rotating liquid drops: results form USML-1 experiments in Space', *Journal of Fluid Mechanics* 276, 1994, pp. 389-403.
8. C.P. Lee, A.V. Anilkumar, and T.G. Wang, 'Static shape of an acoustically levitated drop with wave-drop interaction,' *Physics of Fluids* 6(11), 1994, pp. 3554-3566.
9. R.N. Grugel, X.F. Shen, A.V. Anilkumar, and T.G. Wang, 'The influence of vibration on microstructural uniformity during floating-zone crystal growth,' *Journal of Crystal Growth* 142, 1994, pp. 209-214.
10. C.P. Lee, A.V. Anilkumar, and T.G. Wang, 'Interactions of liquid drops with a levitating sound field,' in *Current Topics in The Physics of Fluids*, edited by Council of Scientific Information (Research Trends, Thiruvananthapuram, India, 1995).
11. T.G. Wang, A.V. Anilkumar, and C.P. Lee, 'Oscillations of liquid drops: results of USML-1 experiments in Space', *Journal of Fluid Mechanics* 308, 1996, pp. 1-14.
12. X.F. Shen, A.V. Anilkumar, R.N. Grugel, and T.G. Wang, 'Utilizing vibration to promote microstructural homogeneity during floating-zone crystal growth processing,' *Journal of Crystal Growth* 165, 1996, pp. pp. 438-446.
13. C.P. Lee, A.V. Anilkumar, and T.G. Wang, 'Streaming generated in a liquid bridge due to nonlinear oscillations driven by vibration of an end wall,' *Physics of Fluids* 8(12), 1996, pp. 3234-3246.
14. C.P. Lee, A.V. Anilkumar, and T.G. Wang, 'A theoretical model for centering of a thin viscous liquid shell in free and forced capillary oscillations,' *Physics of Fluids* 8(10), 1996, pp. 2580-2589.
15. T. Wang, I. Lacik, M. Brissova, A.V. Anilkumar, A. Prokop, D. Hunkeler, R. Green, K. Shahrokhi, and A.C. Powers, 'A new generation capsule and encapsulation system for immunoisolation of pancreatic islets,' *Nature: Biotechnology* 15, 1997, pp. 358-362.
16. A.C. Powers, M. Brissova, I. Lacik, A.V. Anilkumar, and T.G. Wang, 'Permeability assessment of capsules for islet transplantation,' *Annals of the New York Academy of Sciences* 831, 1997, pp. 208-216.
17. M. Brissova, I. Lacik, A.C. Powers, A.V. Anilkumar, and T.G. Wang, 'Control and measurement of permeability for design of microcapsule cell delivery system,' *Journal of Biomedical Materials Research* 39(1), 1998, pp. 52-60.
18. I. Lacik, A.V. Anilkumar, M. Brissova, A.C. Powers, and T.G. Wang, 'New capsule with tailored properties for the encapsulation of living cells,' *Journal of Biomedical Materials Research* 39(1), 1998, pp. 61-70.
19. C.P. Lee, A.V. Anilkumar, A.B. Hmelo and T.G. Wang, 'Equilibrium of liquid drops under the effects of rotation and acoustic flattening: results from USML-2 experiments in Space', *Journal of Fluid Mechanics* 354, 1998, pp. 43-67.
20. Grugel, R.N., Lee, C.P., Anilkumar, A.V. et al. 'Utilizing microgravity environment to investigate thermocapillary flow and microstructural uniformity during floating-zone crystal growth,' *Journal of The Japan Society of Microgravity Applications*, 15 (supp. II), 1998, pp. 407-412.

21. A.V. Anilkumar, J. Bhowmick, and R.N. Grugel, 'Effect of end-wall vibration on oscillatory thermocapillary flow in float-zones,' Reviewed Proceedings of the twelfth International Symposium on Experimental Methods in Microgravity Materials Science, TMS Meeting, March 2000, Nashville, TN; R. Schiffman, editor.
22. A.V. Anilkumar, T.G. Wang, and I. Lacik, 'A novel reactor for making uniform capsules,' *Biotechnology and Bioengineering*, 75 (5), 2001, pp. 581-589.
23. A.V. Anilkumar, A.B. Hmelo, and T.G. Wang, 'Core centering of immiscible compound drops in capillary oscillations: experimental observations,' Journal of Colloid and Interface Science 242, 2001, pp. 465-469.
24. Brissova, M., Anilkumar, A.V., Powers, A.C., and Wang, T.G., 'Biocompatibility of microcapsule immunoisolation device for pancreatic islet transplantation,' *Journal of Biomedical Research*, 2001.
25. Lacik, I., Anilkumar, A.V., and Wang, T.G., 'A two-step process for controlling the surface smoothness of polyelectrolyte-based microcapsules,' *Journal of Microencapsulation,* 18 (4), 2001, pp. 479-490.
26. R.N. Grugel, A.V. Anilkumar, and C.P. Lee, 'Direct observation of pore formation and mobility during controlled melting and re-solidification in microgravity,' *in Solidification Processes and Microstructures*: *A Symposium in Honor of Prof. W. Kurz,* M. Rappaz, C. Beckermann, and R. Trivedi, editors, TMS Publication 2004.
27. A.V. Anilkumar, R.N. Grugel, J. Bhowmick, and T.G. Wang, 'Suppression of thermocapillary oscillations in sodium nitrate half-zones by high-frequency end-wall vibrations,' *Journal of Crystal Growth*, 276, 2005, pp. 194-203.
28. Q. Deng, A.V. Anilkumar, and T.G. Wang, 'Role of viscosity and surface tension in bubble entrapment during liquid drop impact onto surface of a deep liquid pool,' J. Fluid Mech. (2007), vol. 578, pp. 119-138.
29. R.N. Grugel, P. Luz, G. Smith, R. Spivey, L. Jeter, D. Gillies, F. Hua, A.V. Anilkumar, 'Materials research conducted aboard the International Space Station: facilities overview, operational procedures, and experimental outcomes,' *Acta Astronautica* 62 (2008), pp. 491-498.
30. M.C. Cox, A.V. Anilkumar, R.N. Grugel and C.P. Lee, 'Effect of stepwise change in processing pressure on isolated pore growth during controlled directional solidification in small channels,' *Journal of Crystal Growth* 311 (2009), pp. 327-336.
31. Q. Deng, A.V. Anilkumar, and T.G. Wang, 'The phenomenon of bubble entrapment during capsule formation,' *Journal of Colloid and Interface Science* 333 (2009), 523-532.
32. Chun P. Lee, Amrutur V. Anilkumar, and Richard N. Grugel, 'Dynamics of gas evacuation from a honeycomb structure having common wall perforations,' *Journal of Spacecrafts and Rockets* 47 (2010), 649-658.
33. Richard N. Grugel, Lucien N. Brush, and Amrutur V. Anilkumar, 'Disruption of an aligned dendritic network by bubbles during re-melting in a microgravity environment,' *Microgravity Science and Technology* 24 (2012), 93-101.
34. C.P. Lee, A.V. Anilkumar, M.C. Cox, C.B. Lioi, and R.N. Grugel, 'Evolution of elongated pores at the melt-solid interface during controlled directional solidification,' *Acta Materialia* 61 (2013), 3752-3757.
35. A. S. Westover, J. W. Tian, S. Bernath, L. Oakes, R. Edwards, F. N. Shabab, S. Chatterjee, A. V. Anilkumar, and C. L. Pint, 'A Multifunctional Load-Bearing Solid-State Supercapacitor,' *Nano Lett.*, 2014, 14 (6), 3197–3202.

36. P.S. Kumar, W. Emfinger, G. Karsai, D. Watkins, B. Gasser, and A. Anilkumar, 'ROSMOD: A Toolsuite for Modeling, Generating, Deploying, and Managing Distributed Real-time Component-based Software using ROS,' *Electronics*, 2016, 5(3), 53-98.
37. Adam Smith and Amrutur Anilkumar, 'Friction Factor Evaluation of Replaceable-Element and Conventional Oil Filters in a Precision Benchtop Test Facility,' SAE Int. J. Fuels Lubr. 15(3), 2022.
38. Cameron Schepner, Adam Smith, David Schafer, and Amrutur Anilkumar, 'In Situ Assessment of Oil Quality Sensor Performance in Engine Lubricant Flow,' SAE Int. J. Fuels Lubr. 17(2):2024.
39. Thomas Colicci, Andrew Noonan, and Amrutur Anilkumar, 'Implementing Fiber Bragg Grating Sensors for Dynamic Strain Monitoring in Carbon Fiber Launch Vehicle Airframes,' submitted to the Review of Scientific instruments, November 2024.

Peer-Reviewed Conference Publications:

40. A.V. Anilkumar, and T.G. Wang, 'Drop coalescence studies,' Proceedings of NASA Workshop on Containerless Experimentation in Microgravity, Pasadena, CA (1990).
41. B. Sturtevant, H. Glicken, L. Hill, and A.V. Anilkumar, 'Explosive volcanism in Japan and United States: gaining understanding by shock tube experiments,' Proceedings of the Eighteenth International Symposium on Shock Waves, Japan (1991).
42. X.F. Shen, R.N. Grugel, A.V. Anilkumar, and T.G. Wang, 'The influence of controlled surface streaming on thermocapillary convection during float-zone solidification processing,' Proceedings of the Symposium on Microstructural Design by Solidification Processing, TMS Fall Meeting, Chicago, IL (1992).
43. C.P. Lee, A.V. Anilkumar, and T.G. Wang, 'The behavior of a liquid drop levitated and drastically flattened by an intense sound field,' AIAA 92-0112, Proceedings of the thirtieth Aerospace Sciences and Exhibit, Reno, NV (1992).
44. A.V. Anilkumar, C.P. Lee, and T.G. Wang, 'Momentumless coalescence of drops,' AIAA 92-0111, Proceedings of the thirtieth Aerospace Sciences Meeting and Exhibit, Reno, NV (1992).
45. R.N. Grugel, X.F. Shen, A.V. Anilkumar, and T.G. Wang, 'The influence of controlled shape oscillation on microstructural uniformity and development during floating-zone crystal growth,' Proceedings of the International Workshop on G-jitter, Clarkson University, Potsdam, NY (1993).
46. T.G. Wang, A.V. Anilkumar, C.P. Lee, and K.C. Lin, 'A preliminary analysis of the USML-1 drop dynamics experimental results', AIAA 93-0252, Proceedings of the thirty-first Aerospace Sciences Meeting and Exhibit, Reno, NV (1993).
47. T.G. Wang, A.V. Anilkumar, C.P. Lee, and K.C. Lin, 'Bifurcation of rotating liquid drops,' NASA Conference Publication 3272, Proceedings of Joint Launch + One Year Science Review of USML-1, Huntsville, AL (1993).
48. T.G. Wang, A.V. Anilkumar, C.P. Lee, and K.C. Lin, 'Core-centering of compound drops in capillary oscillations,' NASA Conference Publication 3272, Proceedings of Joint Launch + One Year Science Review of USML-1, Huntsville, AL (1993).
49. A. V. Anilkumar, C.P. Lee, and T.G. Wang, 'Studies of the stability and dynamics of levitated drops,' Proceedings of the Third Microgravity Fluid Physics Conference, Cleveland, Ohio (1996).

50. A.V. Anilkumar, and R.N. Grugel, 'Role of vibration-induced streaming in float-zone crystal growth,' Proceedings of the ASME 2000 International Mechanical Engineering Conference and Exposition, Orlando, FL (2000).
51. C.P. Lee, A.V. Anilkumar, and R.N. Grugel, 'Role of vibration-induced streaming in float-zone crystal growth,' AIAA 01-0614, Proceedings of the thirty-ninth Aerospace Sciences Meeting and Exhibit, Reno, NV (2001).
52. R.N. Grugel, A.V. Anilkumar, A.I. Fedoseyev, and K. Mazuruk, 'Some Novel Solidification Processing Techniques being Investigated at MSFC – Their Extension for Study Aboard the ISS,' AIAA 01- 5054, AIAA Conference on International Space Station Utilization, Kennedy Space Center, Orlando, FL (2001).
53. R.N. Grugel, A.V. Anilkumar, P. Luz, L. Jeter, M.P. Volz, R. Spievy, and G. Smith, 'Toward Understanding Pore Formation and Mobility During Controlled Directional Solidification in a Microgravity Environment Investigation (PFMI),' AIAA 01-5119, AIAA Conference on International Space Station Utilization, Kennedy Space Center, Orlando, FL (2001).
54. R.N. Grugel, A.V. Anilkumar, and C.P. Lee, 'Pore Formation and Mobility Investigation (PFMI): Description and Initial Analysis of Experiments Conducted aboard the International Space Station,' Proceedings of the *Spacebound 2003* Conference, Toronto, Canada (2003).
55. R.N. Grugel, and A.V. Anilkumar, 'Bubble formation and transport during directional solidification in microgravity: model experiments on the Space Station,' AIAA 04-627, Proceedings of the 42nd AIAA Aerospace Sciences Meeting and Exhibit, Reno, Nevada, Jan. 5-8, 2004
56. R.N. Grugel, A.V. Anilkumar, and M.C. Cox 'Observations of an aligned gas-eutectic during controlled directional solidification aboard the International Space Station-comparison with ground-based studies,' AIAA 05-919 Proceedings of the 43rd AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV. Jan 10 - 13, 2005
57. M.C. Cox, A.V. Anilkumar, R.N. Grugel, and W.H. Hofmeister, 'Isolated Wormhole Growth and Evolution during Directional Solidification in Small Diameter Cylindrical Channels: Preliminary Experiments,' AIAA 06-1140, Proceedings of the 44th AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV. Jan 9 - 12, 2006
58. R. Grugel, F. Hua, A.V. Anilkumar, et al., 'The In-Space soldering investigation (ISSI): melting and solidification experiments aboard the International Space Station,' AIAA 06-521, Proceedings of the 44th AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan 9-12, 2006.
59. R.N. Grugel, A.V. Anilkumar et al. 'Materials Research conducted aboard the International Space Station: Facilities, Overview, Operational Procedures, and Experimental outcomes,' IAC 06-A2.5.1 Proceedings of the 57th International Astronautical Congress (IAC), Valencia, Spain, October 2-6, 2006.
60. B. T. Blandford, W.O. Runge, Shengteng Hu, A.V. Anilkumar, R.W. Pitz and J.A. Wehrmeyer, 'Hydroxyl Tagging Velocimetry (HTV) to Measure Centerline Velocities in the Near Field Exhaust of a Gas Turbine Engine, AIAA-2008-0235, Proceedings of the 46th AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan 7-10, 2008.
61. A. Alexander, J. Wehrmeyer, W. Runge, B. Blandford, A.V. Anilkumar, and R.W. Pitz, 'Nonintrusive Measurement of Gas Turbine Exhaust Velocity using Hydroxyl Tagging Velocimetry,' AIAA-2008-3709, Proceedings of the 26th AIAA Aerodynamic Measurement Technology and Ground Testing Conference, Seattle, Washington June 23-26, 2008.
62. Richard N. Grugel, Lucien N. Brush, and Amrutur V. Anilkumar, 'Disruption of an Aligned Dendritic Network by Bubbles during re-melting in a Microgravity Environment' 50th AIAA

Aerospace Sciences Meeting, 9 - 12 Jan 2012, Nashville, TN in 26*th Symposium on Gravity - Related Phenomena in Space Exploration.*

63. Andrew S. Westover, John Tian, Shiva Bernath, Landon Oakes, Rob Edwards, Farhan Nur Shabab, Shahana Chatterjee, Amrutur Anilkumar, and Cary L. Pint, 'Multifunctional Load-Bearing Energy Storage Materials,' IMECE2014-38931: Proceedings of the 2014 International Mechanical Engineering Congress and Exposition, November 14-20, 2014, Montreal, Canada.
64. Pranav Srinivas Kumar, William Emfinger, Amogh Kulkarni, Gabor Karsai, Dexter Watkins, Benjamin Gasser, Cameron Ridgewell and Amrutur Anilkumar, 'ROSMOD: A Toolsuite for Modeling, Generating, Deploying, and Managing Distributed Real-time Component-based Software using ROS,' IEEE International Symposium on Rapid System Prototyping, October 8-9, 2015, Amsterdam, The Netherlands.
65. Thomas Colicci, Andrew Noonan, and Amrutur Anilkumar, 'Structural Health Monitoring for Launch Vehicle Reusability Using Fiber Bragg Grating Written Optical Fiber,' AIAA-2025-0113, AIAA SCITECH 2025 Forum, Jan 6-10, Orlando, Fl. 2025.

Invited Newspaper Opinion Articles, Invited Lectures, and Panel Discussions:

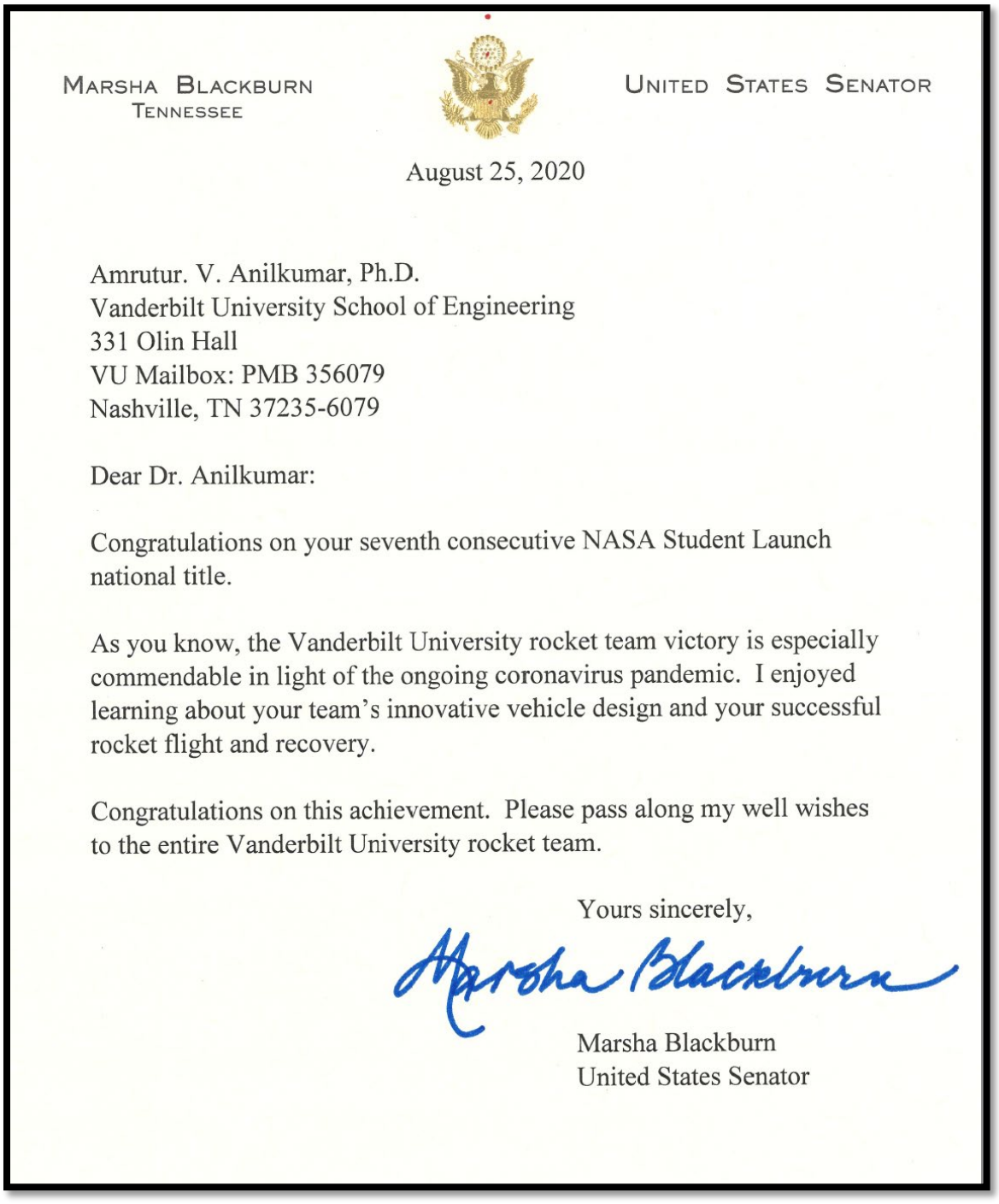
66. 'Reusable Launch Vehicles Industry Trends and University Student Engagement' Plenary Talk at RLV TC Meeting, AIAA SCITECH Forum, Orlando FL. 2025.
67. 'Widespread reusability starts to become a reality', RLV Year in Review, **Aerospace America Dec. 2024.**
68. 'Rocket manufacturers continue to bet big on reusability,' RLV Year in Review, **Aerospace America Dec. 2023.**
69. 'Experiential Learning: Learning by Doing,' Dr. V. Ganesan Faculty Fellow Inauguration Lecture, June 6, 2023, **IIT Madras**. https://www.youtube.com/watch?v=BwcrggLAk4k
70. 'Rocket manufacturers face challenges in push for reusable launch vehicle development,' RLV Year in Review, **Aerospace America Dec. 2022**.
71. 'The Spy Thriller That Wasn't in the Space Thriller That Was,' **Deccan Herald July 17, 2022.** https://www.deccanherald.com/opinion/the-spy-thriller-that-wasnt-in-the-space-thriller-that-was-1127595.html
72. 'Remembering Roddam Narasimha,' **Deccan Herald Jan 12, 2021**. https://www.deccanherald.com/opinion/panorama/remembering-roddam-narasimha-937958.html
73. 'Roddam Narasimha: Epitome of Perfection and Tolerance,' **The Times of India Dec 22, 2020**. https://timesofindia.indiatimes.com/city/bengaluru/roddam-narasimha-epitome-of-perfection-and-tolerance/articleshow/79845819.cms
74. V Ramamurti Faculty Fellow Inauguration Lecture: 'Project-based Extreme Engineering: New Paradigm for Top-Class Engineering Education', Aug 14, 2018, **IIT Madras**, India https://www.youtube.com/watch?v=Xk7nOxz25yk&feature=youtu.be
75. 'Extreme Engineering: A New Paradigm for Top-Class Engineering Education;' 5th June 2017, **IIT Gandhinagar**, Gujarat, India https://www.youtube.com/watch?v=2UZRnHPM5yw
76. 'Aerospace Systems Engineering: The Way Forward;' Aug 11, 2016, IC & SR Auditorium, **IIT Madras**, Chennai, India https://www.youtube.com/watch?v=rB1g9AoV8vk
77. IIT Gandhinagar Lecture Series 'Aerospace Systems Engineering: The Way Forward?' Aug 9, 2016.
78. 'Trends in Engineering: AIAA Education Panel,' Amrutur Anilkumar (Vanderbilt University), Wayne Johnson (Tennessee Tech), Matthew Mensch (UT, Knoxville), Trevor Moeller (UTSI), and Michael Glennon (AEDC), March 30, 2017, UTSI, TN

79. Space Exploration Lecture: Houston, Vandy has a solution!' Vanderbilt Alumni Association, Houston Chapter, Office of Jones Day, Conference Room, 717 Texas Ave, Houston, TX 77002

Expert Opinions, Media Coverage and Public Citations

80. **Newsweek**: on NASA's Mission to Moon
    a. https://www.newsweek.com/artemis-rocket-launch-postponed-discovery-engine-issue-moon-1737700
    b. https://www.newsweek.com/nasa-discarded-hardware-apollo-missions-moon-1739500
81. **Associated Press**: on Jeff Bezos' flight to Space aboard Blue Origin Rocket https://www.vanderbilt.edu/usli/2021/06/17/jeff-bezos-will-blast-into-space-on-rockets-1st-crew-flight/
82. **Internationally acclaimed Rocket Launch Program:** https://news.vanderbilt.edu/vanderbiltmagazine/launch-pad-vanderbilts-internationally-acclaimed-student-rocket-team-has-propelled-many-alumni-into-the-science-of-spaceflight/
83. **Rocket Program at Vanderbilt:** https://engineering.vanderbilt.edu/news/2022/new-fund-to-sustain-vanderbilt-rocket-team-successes/
84. **Space Force Chief Visit:** https://news.vanderbilt.edu/2021/05/27/space-force-gen-john-w-jay-raymond-visits-vanderbilt-laying-groundwork-for-future-partnership/
85. **NASA University Student Launch Successes:**
    a. https://engineering.vanderbilt.edu/news/2020/vanderbilt-rocketeers-win-seventh-nasa-launch-national-title/
    b. https://engineering.vanderbilt.edu/news/2019/rocketeers-claim-sixth-nasa-championship-with-novel-uav-search-and-deploy-mission/
    c. https://engineering.vanderbilt.edu/news/2015/vanderbilt-aerospace-club-continues-its-winning-ways-at-national-rocket-competition/
86. **AIAA Faculty Advisor of the Year Award**:
    For passionate promotion of novel aerospace design activities, community outreach and mentoring of students to success at national competitions and in pursuit of aerospace engineering careers." https://www.aiaa.org/SciTech2016AwardsPresented/
87. **AIAA Abe Zarem Faculty Award**:
    https://engineering.vanderbilt.edu/news/2016/mechanical-engineering-graduate-student-collects-national-and-international-astronautical-awards/
88. **Renewable Energy Public Park**:
    https://engineering.vanderbilt.edu/news/2022/10-years-on-nashvilles-love-circle-vanderbilt-is-a-high-tech-neighbor/

89. **Public Citation from US Senator Marsha Blackburn, August 2020**



MARSHA BLACKBURN
TENNESSEE

UNITED STATES SENATOR

August 25, 2020

Amrutur. V. Anilkumar, Ph.D.
Vanderbilt University School of Engineering
331 Olin Hall
VU Mailbox: PMB 356079
Nashville, TN 37235-6079

Dear Dr. Anilkumar:

Congratulations on your seventh consecutive NASA Student Launch national title.

As you know, the Vanderbilt University rocket team victory is especially commendable in light of the ongoing coronavirus pandemic. I enjoyed learning about your team's innovative vehicle design and your successful rocket flight and recovery.

Congratulations on this achievement. Please pass along my well wishes to the entire Vanderbilt University rocket team.

Yours sincerely,

Marsha Blackburn

Marsha Blackburn
United States Senator

90. **AIAA, NASA Award Citations**

AIAA

Shaping the Future of Aerospace

Faculty Advisor Award

To recognize the faculty advisor of a chartered AIAA Student Branch who, in the opinion of student branch members and the AIAA Student Activities Committee, has made outstanding contributions.

Presented To

Amrutur V. Anilkumar

"For passionate promotion of novel aerospace design activities, community outreach and mentoring of students to success at national competitions and pursuit of aerospace engineering careers."

January 2016

AIAA President

AIAA Honors and Awards Chair

The National Aeronautics and Space Administration
Presents the

Public Service Group Achievement Award

for the

Drop Physics Module-2 Principal Investigator Teams

to

A. V. Anilkumar

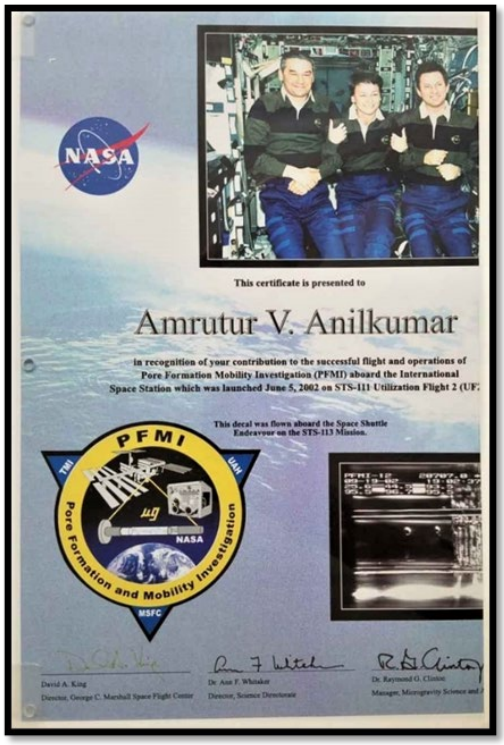
Vanderbilt

in recognition of outstanding support of the Drop Physics Module-2 instrument development and mission operations.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION U.S.A.

Signed and sealed at Washington, D.C.,
this ninth day of April
nineteen hundred and ninety-six

Daniel S. Goldin, Administrator, NASA



91. **Aerospace Design Laboratory UG Advisees and Career Placement**

Jack Abrams	Nextera	2024
Isai Andrade	TBD	2024
Leonardo Brenes	Caltech	2024
Evangelos Chatziandreou	Georgia Tech	2024
David Limpus	Purdue	2024
Aziz Medhioub	Tesla	2024
Sebastian Nunez	TBD	2024
Ryan Taylor	Rolls Royce	2024
Isabella Wynocker	SpaceX	2024
Jonathan Zak	Vanderbilt	2024
Thomas Colicci	Anduril	2024
Cameron Schepner	SpaceX	2023
Matthew McGowan	Blue Origin	2023
Thomas Dintino	Lockheed Martin	2023
Steven Cermeno	Deloitte	2023
James Wedgbury	Boeing	2023
Eric Holst	Purdue	2023
Kush Hari	UC Berkeley	2023
Andrew Noonan	Vanderbilt	2023
Ben Shani	Maryland	2023
Joseph Aquino	Eastman	2022
Sebastian Bond	Vanderbilt	2022
Thomas Colicci	Vanderbilt	2022
Zachary Friedman	Avascent Aerospace	2022
Brian Knapp	GE Aviation	2022
Abdul Latif	Amazon	2022
Kellen Lively	L3 Harris	2022
Kai Malcom	Rice University	2022
Ethan Mayer	Vanderbilt	2022
Marissa Schwarz	Deloitte	2022
Ozgur Orun	UC Berkeley	2022
Adam Smith	Blue Origin	2022
Ryan Burinescu	Braven Environ.	2021
Alif Emazuddin	UT Knoxville	2021
Ali Kilic	Vanderbilt	2021
Jon Marchineck	Crowe's Consulting	2021
Nick Pierce	Vanderbilt	2021
Will Reisner	Lockheed Martin	2021
Cam Schepner	Vanderbilt	2021
Alex Stevens	Permobil	2021
William Wu	Amazon	2021
Alex Barnett	Permobil	2020
Abby Carlson	Boeing	2020
Jake Gloudemans	The Boring Co.	2020
Tristan Gilbert	UC Berkeley	2020
Ben Hsu	US Govt.	2020
Ethan James	Booz Allen Hamilton	2020
Emre Kanli	Imperial College	2020
Matt McDonald	GE	2020

Sophia Moak	GE	2020
Luke Neise	Stanford	2020
Jon Powles	SpaceX	2020
Adam Smith	Vanderbilt	2020
Kis Tamas	Stanford	2020
Brayden Aller	CalTech	2019
Nick Belsten	MIT	2019
Henry Bristol	McKinsey	2019
Emily Herron	Amazon	2019
Liam Kelly	Lyft	2019
Conner Morency	UC Boulder	2019
Pierce Finley	Lockheed Martin	2019
Chris Romanoski	AEDC	2019
Mark Scherer	Hive	2019
Sara Tsai	Vanderbilt	2019
Kyle Ward	Texas A&M	2019
Spencer Kallor	Raytheon	2018
Jered D-Trujillo	MIT	2018
Nick Galioto	Univ. of Michigan	2018
Dominic Ghilardi	Lockheed Martin	2018
Daniel Schneller	TE Connectivity	2018
Kurt Lezon	Qualcomm	2018
Xavier Williams	Michigan Tech	2018
Katie Hornbeck	Exxon	2018
Will Pagano	Citibank	2018
Taylor Parra	US Navy Pilot School	2018
Alex Byrd	Aegis Tech	2018
Peyton Fite	US Government	2018
Derek Phillips	SpaceX	2017
Brad Bark	SpaceX	2017
Michael Gilliland	SpaceX	2017
Dustin Howser	Lockheed Martin	2017
Grady Lynch	Lockheed Martin	2017
Nina Campano	Lockheed Martin	2017
Paul Register	Stanford	2017
Artie Binstein	Stanford	2017
Ross Weber	Stanford	2017
Jimmy Pan	Honeywell Aerospace	2017
Brian Ramsey	Deloitte Consulting	2017
Paul Moore	Capital One	2017
Andrew Voss	SpaceX	2016
Rob Rutherford	SpaceX	2016
Quinlan Monk	SpaceX	2016
Andrew Martin	TE Connectivity	2016
Justin Broughton	Georgia Tech	2016
Dylan Shane	UT Austin	2016
Rebecca Riley	UC Irvine	2016
David Hirsch	University of Illinois	2016
Matt Kelley	Power Plan	2016
Mitch Masia	Consultancy	2016

Connor Caldwell	Deloitte Consulting	2015
Frederick Folz	SpaceX	2015
Alex Goodman	DISH Analytics	2015
Chris Lyne	Vanderbilt	2015
Jacob Moore	UT Austin	2015
Cameron Ridgewell	Virginia Tech.	2015
William Emfinger	Permobil	2015
Pranav Kumar	Siemens	2015
Shiva Bernath	SpaceX	2014
Kevin Bush	Stanford	2014
Brandon Dimmig	Huntington Ingalls	2014
Patrick Foran	SpaceX	2014
Chris Twedell	Lockheed Martin	2014
Jordan Salik	SpaceX	2014
Francene Corradetti	Boeing	2013
Jason Lee	Capgemini	2013
Brock Smethills	Sterling Ranch Co.	2013
Ryan Thompson	Baker Hughes	2013
Justin Langford	Cummins	2013
Dexter Watkins	Northrop Grumman	2013
Paul Allen	Devon Energy	2012
Tyler Hannan	Georgia Tech.	2012
Thomas Hardy	Mercedes Benz	2012
Chris Lioi	Georgia Tech.	2012
Erin McManus	RTI Soft	2012
Zack Smith	Devon Energy	2012
Taylor Stevenson	University of Oklahoma JD	2012

Kyle Bloemer	UKY MD	2011
Chris Cameron	UT Austin	2011
Ben Chociej	Juristat	2011
Jennifer Frankland	Georgia Tech; Siemens	2011
Jonathan Hoke	USC; Boeing	2011
Sam Malonoski	ZF Friedrichshafen	2011
Ryan Taylor	Fisher Klosterman	2011
Ty Barringer	Wash. U. JD	2010
James Board	Georgia Tech.	2010
Ben McKnight	Sargent & Lundy	2010
Sam Nackman	Princeton; SpaceX	2010
Kyle Rosenstein	UKY MD	2010
Nick Vass	Georgia Tech. Raytheon	2010
Thomas Bowden	Quartus Eng.	2009
Ben Havrilesko	Georgia Tech.	2009
Tyler Lamb	Northrop Grumman	2009
Haziq Mazlan	OSISoft	2009
Kyser Miree	Chevron	2009
Will Runge	Georgia Tech.	2009
Thomas Folk	Georgia Tech; Rolls Royce	2008
Andrew Gould	Florida Turbine Tech.	2008
Nathan Grady	Vanderbilt	2008
Alex Sobey	NASA MSFC	2008
Chris McMenamin	Lockheed Martin	2008

92. **Aerospace Design Laboratory Graduate Student Advisees and Career Placement:**

Jayantha Bhowmick	MS 2001	Schlumberger
Matthew Cox	MS 2005	Holland & Knight LLP
Qiang Deng	PhD 2006	Hilti Energy Group
Brien Blandford	MS 2007	Databricks
Chris Lyne	MS 2017	Exoterra Resources
Adam Smith	MS 2022	Blue Origin
Cameron Schepner	MS 2023	Space X
Thomas Colicci	MS 2024	Anduril
Andrew Noonan	(MS 2025)	
Jonathan Zak	(MS 2026)	

93. **PhD Committee Member (Primary Advisor R. W. Pitz)**:

Thomas Brown	PhD (1991)	NASA MSFC
Sastri Nandula	PhD (2003)	TLGS Consulting
Marc Ramsey	PhD (2013)	RAPA Technologies
Nathan Grady	PhD (2015)	CANVAS
Carl Hall	PhD (2016)	AEDC

94. **AIAA Seminars Arranged as Chairman Reusable Launch Vehicle Technical Committee.**

1. Fiber-Optic Sensing and Applications to Reusable Launch Vehicles
   Patrick Chan, PhD, NASA Armstrong Flight Research Center
   Tuesday March 8, 2022.
2. Reusability in the New Space Revolution
   Zachary Friedman, RLV TC Member
   Vanderbilt University.
   Tuesday April 12, 2022.
3. Burn-Resistant Materials for High-Performance Reusable Rocket Engines
   Zachary Cordero, Boeing Assistant Professor
   Department of Aeronautics and Astronautics, Massachusetts Institute of Technology
   Tuesday July 12, 2022.
4. Mission Assurance for Reusable Launch Vehicles
   Vinay Goyal, Technical Fellow Aerospace Corporation
   Tuesday September 13, 2022.
5. In-Space Manufacturing, an RLV Enabled Technology
   Jordan Croom, Varda Space
   Wednesday March 22, 2023.
6. Dream Chaser Mission to Space Station
   Sara Tsai, Sierra Space
   Wednesday May 10, 2023.
7. Capturing Mechanics in Extreme Environments: From High-speed Flight to Planetary Exploration
   Seetha Raghavan, Ph.D.
   Professor of Aerospace Engineering and Associate Dean of Research & Graduate Studies, Embry-Riddle Aeronautical University; Tuesday August 29, 2023
8. A Reliability-Based Damage Tolerance Method for Reusable Launch and Space Vehicle Hardware
   Leland Shimizu
   Senior Engineer, Aerospace Corporation
   Tuesday Nov 14, 2023
9. Health Monitoring of Composite Aerospace Structures with Embedded Fiber Bragg Grating Sensors
   Brayden Aller, Graduate Student Caltech
   Tuesday July 30th, 2024
10. Structural Health Monitoring for Launch Vehicle Reusability Using Fiber Bragg Grating Written Optical Fibers
    Thomas Colicci, MS Graduate Student
    Tuesday April 2, 2024

95. **Roddam Narasimha Distinguished Seminars Arranged at the Indian Institute of Technology Gandhinagar, India, as Chairman of the Organization Panel.**

1. Jayant Haritsa (Infosys Prize, Bhatnagar Prize winner)
   Professor of Computer Science, Indian Institute of Science
   5th August 2019
   Data Science: The Good, The Bad and the Ugly

2. Prof. B. S. Murty (Bhatnagar Prize Winner)
   Director, Indian Institute of Technology, Hyderabad
   13th August 2018
   Role of Advanced Materials in Transforming India into a Global Leader

3. Prof. T. Pradeep (Bhatnagar Prize, Eni Prize Winner)
   Institute Professor of Chemistry, Indian Institute of Technology, Madras; 6th June 2017
   Clean water using advanced materials: Science, Incubation, and Industry

4. Mr. A. S. Kiran Kumar (Vasvik Award, Bhaskara Award Winner)
   Chairman, Indian Space Research Organization
   10th August 2016
   Space Technology – Contribution to India's Development

5. Dr. Milind Tambe (John McCarthy Award, ACM SIGART Award Winner)
   Gordon McKay Professor of Computer Science and Director of Center for Research on Computation and Society, Harvard University
   10th August 2015
   Towards a Science of Security Games: Key Algorithmic Principles, Deployed Applications and Research Challenges

6. Dr. Sang Il Seok, Professor, Korea Institute of Science & Technology
   13th April 2015
   Architecture, Process and Materials for Efficient Inorganic-Organic Hybrid Solar Cells

7. Dr. John O. Dabiri, Centennial Chair Professor, California Institute of Technology
   31stJanuary, 2014
   Bio-inspired Wind Energy: From Fish Schools and Seagrass to Better Wind Farms

8. Dr. Maureen McCann, Director Purdue University NEPTUNE Center for Power, and Energy (currently Center Director at National Renewable Energy Laboratory, NREL)
   16th April 2013
   The Biomass to Biofuels Pipeline: An Engineering Paradigm for National Security and a Sustainable Carbon Economy.