Dr. Moriba Kemessia Jah
University of Texas at Austin
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a. Professional Preparation

Embry-Riddle Aeronautical Univ.	Aerospace Engineering	B.S., 1999
University of Colorado (Boulder)	Aerospace Eng. Sciences	M.S., 2001
University of Colorado (Boulder)	Aerospace Eng. Sciences	Ph.D., 2005

Doctoral Dissertation: "Mars Aerobraking Spacecraft State Estimation By Processing Inertial Measurement Unit Data"

b. Work Experience

2017 – Present University of Texas (UT) Austin, TX
Associate Professor
Cockrell School of Engineering
Aerospace Engineering and Engineering Mechanics Department

2016 – 2017 University of Arizona (UA) Tucson, AZ
Director, Space Object Behavioral Sciences (SOBS)
Associate Research Scientist and Professor, College of Engineering
Continuing Status (Tenure-Equivalent) Appointment and Joint (Courtesy) Appointments in the following Departments: Aerospace and Mechanical Engineering, Electrical and Computer Engineering, and Geosciences

- Develop, lead, perform, and maintain leading-edge research in space object behavior quantification, assessment, and prediction in the context of planetary defense, space situational awareness, space traffic management, orbital safety, space exploration, and long-term sustainability of space activities.
- Provide long-term goals, shape, and align UA research strengths with (SOBS) community's needs.
- Perform continuous assessment of UA SOBS program status while maintaining and growing both basic and applied research which relates to SOBS.
- Provide technical and functional leadership in SOBS, mentorship and guidance to UA faculty and staff.
- Lead/assist in the development of SOBS program requirements.
- Ensure SOBS goals and objectives are clearly defined, understood, and achieved.
- Provide overarching technical expertise to the development of SOBS capabilities.
- Apply system engineering expertise in support of SOBS program milestones/reviews.
- Perform risk assessments, support source selection capability providers, acquisition milestones and readiness assessment activities.
- Lead and coordinate University-wide responses to government solicitations such as BAAs, contract task orders, and other forms of government solicitation.
- Interact with government, industry, academic, domestic and international SOBS-related organizations.

2016 - Present Royal Melbourne Institute of Technology (Melbourne, Australia)
SERC Funded Visiting Professorship

Adjunct Professor

2014 – 2016 Air Force Research Laboratory Kirtland AFB, NM
Mission Lead, Space Situational Awareness [SSA] (AFRL/RV)
Director, Advanced Sciences and Technology Research Institute for Astronautics (ASTRIA)

- Respond to directorate strategic guidance to develop long term goals and shape the portfolio of the SSA mission area.
- Manage risk and balance in portfolio, recommending SSA projects to divest, reinvest and reallocate.
- Interface with external customers at the strategic level to develop cooperative and jointly funded programs.
- Recommend RV SSA portfolio to RV directorate leadership that is de-conflicted with and leverages other AFRL directorates and S&T organizations while maximizing RV internal subject experts as much as possible.
- Perform a continuous assessment of program status, lead ad-hoc or formal studies and maintain emphasis on a full spectrum of basic and applied research portfolio.

2007 – 2014 AFRL Maui and Kirtland AFB, NM
Technical Advisor, Guidance Navigation and Control Group (AFRL/RVSVC)
Director, Advanced Sciences and Technology Research Institute for Astronautics (ASTRIA)

- Provide technical leadership, guidance, and direction to various national and international projects and programs relevant to Satellite GN&C, Space Surveillance, and Space Situational Awareness.
- Direct ASTRIA in support of astrodynamics research and development as prime input into the U.S. Air Force Space Command's Astrodynamics Innovation Committee (AIC).
- Provide expertise in applied estimation theory with algorithm design, development, and implementation as related to astrodynamics and data fusion technologies.
- Design and develop orbit determination software for electro-optical based data.
- Conduct simulations and covariance studies for various space surveillance scenarios.
- Estimate space object trajectories, non-dynamic and dynamic model parameters from electro-optical data.

2014 University of New South Wales (Canberra, Australia)
Rector Funded Visiting Fellow

2006 – 2007 Oceanit Laboratories, Inc. Kihei, HI
Senior Scientist

- Provide expertise in Kalman Filter design, development, and implementation.
- Develop orbit determination algorithms for optical-based data.
- Estimate space object trajectories from optical data.
- Train and mentor junior personnel in the scientific approach and research practices.
- Perform technical planning, system specifications, and interface definition. Apply structured approaches to define customer requirements.

1999 – 2006 NASA/Jet Propulsion Laboratory Pasadena, CA
Navigation Engineer/Orbit Determination Analyst

- Served as radiometric navigation engineer in support of robotic interplanetary missions.
- Developed radiometric and inertial sensor navigation software for ground and flight applications.

- Estimated spacecraft trajectories from radiometric and inertial sensor data.
- Performed trajectory simulations using the DPTRAJ/ODP navigation software.
- Operations Experience: Mars Global Surveyor, Mars Odyssey, Mars Express (ESA), Mars Exploration Rovers, Muses-C (JAXA), and Mars Reconnaissance Orbiter (lead orbit determination analyst for interplanetary cruise phase of the mission).

1997 – 1999 Microcosm Inc. Torrance, CA
Space Mission Design and Orbit Analyst

- Performed orbital analysis for the Ellipso satellite constellation.
- Analyzed sensor placement for the Globalstar satellite constellation.
- Created technical illustrations included in the 3rd edition of Space Mission Analysis and Design, by James Wertz.

1996 – 1999 Embry-Riddle Aeronautical University Prescott, AZ
NASA Space Grant Researcher

- Designed lunar gravity-assist trajectories as a method to achieve free Earth plane change maneuvers.
- Developed space mission design software for the analysis of non-exotic Earth-Moon trajectories.

1996 – 1997 Los Alamos National Lab Los Alamos, NM
Space Engineering Assistant

- Investigated and described methods of designing general lunar missions and swing-by trajectories.
- Researched Spacecraft/Space Mission Design.
- Demonstrated the feasibility of using commercial-off-the-shelf software as a method by which to design and model lunar trajectories.

c. Peer-Reviewed Publications

1. Psiaki, M. L., Weisman, R., **Jah**, **M.,** (2015). *"Gaussian Mixture Approximation of the Angles-Only Initial Orbit Determination Likelihood Function,"* AIAA Journal of Guidance, Control, and Dynamics,, Submitted (11/16/2016)..
2. Stauch, J., Bessell, T., Rutten, M., Baldwin**,** J., **Jah**, **M.,** Hill, K., (2016). *"Mutual Application of Joint Probabilistic Data Association, Filtering, and Smoothing Techniques for Robust Multiple Space Object Tracking,"* AIAA Journal of Guidance, Control, and Dynamics, Special Issue on Space Domain Awareness, Submitted (5/16/2016).
3. Coder, R., Wetterer, C., Hamada, K., **Jah**, **M.,** Holzinger, M., (2016). *"Inferring Active Control Mode of the Hubble Space Telescope Using a Rao-Blackwellized Particle Filter,"* AIAA Journal of Guidance, Control, and Dynamics, Special Issue on Space Domain Awareness, Accepted (2/8/2017).
4. Coder, R., Holzinger, M., **Jah**, **M.,** (2016). *"Space Object Active Control Mode Inference Using Light Curve Inversion,"* AIAA Journal of Guidance, Control, and Dynamics, Special Issue on Space Domain Awareness, Submitted (5/16/2016).
5. DeMars, K. J., Hussein, I. I., Frueh, C., **Jah, M. K**., & Erwin, R. S. (2015). Multiple-object space surveillance tracking using finite-set statistics. *Journal of Guidance, Control, and Dynamics*, *38*(9), 1741–1756. http://doi.org/10.2514/1.G000987
6. Stauch, J., & **Jah, M.** (2015). Unscented schmidt-Kalman filter algorithm. *Journal of Guidance, Control, and Dynamics*, *38*(1), 117–123. http://doi.org/10.2514/1.G000467

7. Leve, F., & **Jah, M.** (2014). Spacecraft actuator alignment determination through null-motion excitation. *IEEE Transactions on Aerospace and Electronic Systems*, *50*(3), 2336–2342. http://doi.org/10.1109/TAES.2013.120187
8. Linares, R., **Jah, M. K.**, Crassidis, J. L., Leve, F. A., & Kelecy, T. (2014). Astrometric and photometric data fusion for inactive space object mass and area estimation. *Acta Astronautica*, *99*(1), 1–15. http://doi.org/10.1016/j.actaastro.2013.10.018
9. Kelecy, T., **Jah, M.,** Baldwin, J., & Stauch, J. (2014). High Area-to-Mass ratio object population assessment from data/track association. *Acta Astronautica*, *96*(1), 166–174. http://doi.org/10.1016/j.actaastro.2013.11.037
10. Linares, R., **Jah, M. K**., Crassidis, J. L., & Nebelecky, C. K. (2014). Space object shape characterization and tracking using light curve and angles data. *Journal of Guidance, Control, and Dynamics*, *37*(1), 13–25. http://doi.org/10.2514/1.62986
11. DeMars, K. J., Cheng, Y., & **Jah, M. K**. (2014). Collision probability with Gaussian mixture orbit uncertainty. *Journal of Guidance, Control, and Dynamics*, *37*(3), 979–984. http://doi.org/10.2514/1.62308
12. Vishwajeet, K., Singla, P., & **Jah, M.** (2014). Nonlinear uncertainty propagation for perturbed two-body orbits. *Journal of Guidance, Control, and Dynamics*, *37*(5), 1415–1425. http://doi.org/10.2514/1.G000472
13. Wetterer, C. J., Linares, R., Crassidis, J. L., Kelecy, T. M., Ziebart, M. K., **Jah, M. K.**, & Cefola, P. J. (2014). Refining space object radiation pressure modeling with bidirectional reflectance distribution functions. *Journal of Guidance, Control, and Dynamics*, *37*(1), 185–196. http://doi.org/10.2514/1.60577
14. Früh, C., & **Jah, M. K.** (2014). Coupled orbit-attitude motion of high area-to-mass ratio (HAMR) objects including efficient self-shadowing. *Acta Astronautica*, *95*(1), 227–241. http://doi.org/10.1016/j.actaastro.2013.11.017
15. Früh, C., **Jah, M.**, (2013). Attitude and Orbit Propagation of High Area-to-Mass Ratio (HAMR) Objects Using a Semi-Coupled Approach. *Journal of the Astronautical Sciences*, pp. 1-19, published 9 July 2014.
16. Früh, C., Kelecy, T. M., & **Jah, M. K.** (2013). Coupled orbit-attitude dynamics of high area-to-mass ratio (HAMR) objects: Influence of solar radiation pressure, Earth's shadow and the visibility in light curves. *Celestial Mechanics and Dynamical Astronomy*, *117*(4), 385–404. http://doi.org/10.1007/s10569-013-9516-5
17. DeMars, K. J., Bishop, R. H., & **Jah, M. K.** (2013). Entropy-based approach for uncertainty propagation of nonlinear dynamical systems. *Journal of Guidance, Control, and Dynamics*, *36*(4), 1047–1057. http://doi.org/10.2514/1.58987
18. DeMars, K. J., & **Jah, M. K.** (2013). Probabilistic initial orbit determination using Gaussian mixture models. *Journal of Guidance, Control, and Dynamics*, *36*(5), 1324–1335. http://doi.org/10.2514/1.59844
19. DeMars, K. J., **Jah, M. K.**, & Schumacher Jr., P. W. (2012). Initial orbit determination using short-arc angle and angle rate data. *IEEE Transactions on Aerospace and Electronic Systems*, *48*(3), 2628–2637. http://doi.org/10.1109/TAES.2012.6237613
20. Kelecy, T., **Jah, M.**, & DeMars, K. (2012). Application of a Multiple Hypothesis Filter to near GEO high area-to-mass ratio space objects state estimation. *Acta Astronautica*, *81*(2), 435–444. http://doi.org/10.1016/j.actaastro.2012.08.006
21. Kelecy, T., & **Jah, M.** (2011). Analysis of high area-to-mass ratio (HAMR) GEO space object orbit determination and prediction performance: Initial strategies to recover and predict HAMR GEO trajectories with no a priori information. *Acta Astronautica*, *69*(7–8), 551–558. http://doi.org/10.1016/j.actaastro.2011.04.019

22. Tombasco, J., Axelrad, P., & **Jah, M.** (2010). Specialized coordinate representation for dynamic modeling and orbit estimation of geosynchronous orbits. *Journal of Guidance, Control, and Dynamics*, *33*(6), 1824–1836. http://doi.org/10.2514/1.48903
23. Wetterer, C. J., & **Jah, M.** (2009). Attitude estimation from light curves. *Journal of Guidance, Control, and Dynamics*, *32*(5), 1648–1651. http://doi.org/10.2514/1.44254
24. **Jah, M. K.**, Lisano, M. E., Born, G. H., & Axelrad, P. (2008). Mars aerobraking spacecraft state estimation by processing inertial measurement unit data. *Journal of Guidance, Control, and Dynamics*, *31*(6), 1802–1813. http://doi.org/10.2514/1.24304
25. Kelecy, T., **& Jah, M.** (2010). Detection and orbit determination of a satellite executing low thrust maneuvers. *Acta Astronautica*, *66*(5–6), 798–809. http://doi.org/10.1016/j.actaastro.2009.08.029
26. Antreasian, P. G., Baird, D. T., Border, J. S., Burkhart, P. D., Graat, E. J., **Jah, M. K**., … Portock, B. M. (2005). 2001 Mars Odyssey orbit determination during interplanetary cruise. *Journal of Spacecraft and Rockets*, *42*(3), 394–405. http://doi.org/10.2514/1.15222

d. Refereed Conference Papers and Official Reports

1. O. Brown, T. Cottom, M. Gleason, M. Hallex, A. Long, E. Rivera, D. Finkleman, T. Hitchens, **M. Jah**, D. Koplow, R. Sedwick, (2016). *"Report on Space Traffic Management Assessments, Frameworks, and Recommendations,"* In Reply To: Public Law No. 114-90, "U.S. Commercial Space Launch Competitiveness Act" Title I, "Spurring Private Aerospace Competitiveness and Entrepreneurship" Section 109, "Orbital Traffic Management", 21 November.
2. J. Kent, I. Hussein, **M. Jah**, (2016). *"Directional Distributions In Tracking of Space Debris,"* 19th International Conference on Information Fusion, Heidelberg, Germany, July.
3. D. Slater, R. Ridenoure, D. Klumpar, J. Carrico, **M. Jah**, (2016) *"Light to Sound: The Remote Acoustic Sensing Satellite (RASSat),"* AIAA/USU Small Satellite Conference, Logan, UT July, SSC 16-X1-05.
4. **M. Jah.**, (2015). "*Astrodynamics Collaborative Environment: A Step Toward Data Sharing and Collaboration Via the Air Force Research Laboratory,"* 25th AAS/AIAA Space Flight Mechanics Meeting, Williamsburg, VA, January, AAS 15-449.
5. D. Koblick, M. Klug, A. Goldsmith, B. Flewelling, **M. Jah**, J. Shanks, R. Piña**,** (2014). "*Ground Optical Signal Processing Architecture for Contributing SSA Space Based Sensor Data*" Advanced Maui Optical and Space Surveillance Technologies (AMOSTech) 2014 Conference, Wailea, Maui, Hawaii, September.
6. C. Wetterer, R. Hunt, P. Kervin, **M. Jah**, (2014). *"Comparison of Unscented Kalman Filter and Unscented Schmidt Kalman Filter in Predicting Attitude and Associated Uncertainty of a Geosynchronous Satellite*," Advanced Maui Optical and Space Surveillance Technologies (AMOSTech) 2014 Conference, Wailea, Maui, Hawaii, September.
7. C. Wetterer, K. Hill, **M. Jah**, (2014). *"Comparison of Radiation Pressure Perturbations on Rocket Bodies and Debris at Geosynchronous Earth Orbit*," Advanced Maui Optical and Space Surveillance Technologies (AMOSTech) 2014 Conference, Wailea, Maui, Hawaii, September.
8. M. Wilkins, P. Schumacher, **M. Jah**, (2014). *"Implications of Hierarchies for RSO Recognition, Identification, and Characterization,"* AIAA/AAS Astrodynamics Specialist Conference, San Diego, CA, August, AIAA 2014-4369.

9. J. Stauch, **M. Jah**, J. Baldwin, T. Kelecy, K. Hill, (2014). *"Mutual Application of Joint Probabilistic Data Association, Filtering, and Smoothing Techniques for Robust Multiple Space Object Tracking,"* Invited, AIAA/AAS Astrodynamics Specialist Conference, San Diego, CA, August, AIAA 2014-4365.
10. R. Wiesman, **M. Jah**, (2014). *"Uncertainty Quantification for Angles-Only Initial Orbit Determination,"* AAS/AIAA Space Flight Mechanics Meeting, Santa Fe, NM, January 26-30, AAS 14-434.
11. C. Früh, D. Ferguson, C. Lin, **M. Jah**, (2014). *"Passive Electrostatic Charging of Near-Geosynchronous Space Debris HAMR Objects and Its Effects on the Coupled Object Dynamics"* AAS/AIAA Space Flight Mechanics Meeting, Santa Fe, NM, January 26-30, AAS 14-428.
12. K. Hill, C. Wetterer, **M. Jah**, (2014). *"Comparison of Gravitational, Third-Body, and Radiation Pressure Perturbations in Orbit Propagation"* AAS/AIAA Space Flight Mechanics Meeting, Santa Fe, NM, January 26-30, AAS 14-396.
13. R. Linares, J. Crassidis, **M. Jah.**, (2014). *"Particle Filtering Light Curve Based Attitude Estimation for Non-Resolved Space Objects"* AAS/AIAA Space Flight Mechanics Meeting, Santa Fe, NM, January 26-30, AAS 14-210.
14. I. Hussein, Z. Sunberg, S. Chakravorty, **M. Jah.**, R. Erwin, (2014). *"Stochastic Optimization for Sensor Allocation Using AEGIS-FISST"* AAS/AIAA Space Flight Mechanics Meeting, Santa Fe, NM, January 26-30, AAS 14-209.
15. Cheng, Y., DeMars, K. J., Früh, C., and **Jah, M. K.,** (2013). *"Gaussian Mixture PHD Filter for Space Object Tracking,"* AAS/AIAA Space Flight Mechanics Meeting, Kauai, Hawaii, February 10-14.
16. C. Früh, D. Ferguson, C. Lin, T. Kelecy, F. Leve, **M. Jah**, (2013). *"The effect of passive electrostatic charging on near-geosynchronous high area to mass ratio objects,"* Proceedings of the International Astronautical Congress.
17. C. Früh, **M. Jah**, (2013). *"Detection Probability of Earth Orbiting Objects Using Optical Sensors in Different Observation Scenarios,"* Proc. AIAA/AAS Astrodynamics Specialists Conference, Hilton Head, August.
18. C. Früh, **M. Jah**, E.Valdez, T. Kelecy, P. Kervin, (2013). *"Initial Taxonomy and Classification Scheme for Artificial Space Objects,"* Proceedings of the 2013 AMOS Technical Conference, Maui, Hawaii.
19. C. Früh, **M. Jah**, (2013). *"Attitude and Orbit Propagation of High Area-to-Mass Ratio (HAMR) Objects using a Semi-Coupled Approach,"* Proc. AAS Space Flight Mechanics Conference, Kauai, HI, February 2013.
20. C. Früh, **M. Jah**, (2013). *"Coupled Orbit-Attitude Motion of High Area-to-Mass Ratio (HAMR) Objects including Self-Shadowing,"* Proc. AAS Space Flight Mechanics Conference, Kauai, HI, February 2013.
21. I. Hussein, C. Frueh, R. S. Erwin and **M. Jah,** (2013).*"An AEGIS-FISST algorithm for joint detection, classification and tracking,"* AAS/AIAA Space Flight Mechanics Meeting, Kauai, HI, February.
22. I. Hussein, K. J. DeMars, R. S. Erwin and **M. Jah,** (2013) *"An AEGIS-FISST sensor management approach for joint detection and tracking in SSA,"* AAS/AIAA Space Flight Mechanics Meeting, Kauai, HI, February.
23. Kelecy, T., M. Shoemaker and **M. Jah**, (2013). *"Application of the Constrained Admissible Region Multiple Hypothesis Filter to Initial Orbit Determination of a Break-up,"* 6th European Conference on Space Debris, Darmstadt, Germany, April 22-25.
24. Kelecy, T., **M. Jah**, P. Sydney and P. Kervin, (2013*). "Analysis of Pan-STARRS Photometric and Astrometric Data for Data Association and Physical Consistency*

Assessment," 6th European Conference on Space Debris, Darmstadt, Germany, April 22-25.

25. Payne, T., **M. Jah**, J. Baldwin and T. Kelecy, (2013). *"High Area-to-mass Ratio Object Population Assessment from Data/Track Association,"* 6th European Conference on Space Debris, Darmstadt, Germany, April 22-25.
26. Früh, C., T. Schildknecht, **M. Jah**, T. Kelecy, P. Kervin, D. Hall and E. Valdez, (2013). *"Development of an Initial Taxonomy and Classification Scheme for Artificial Space Objects,"* 6th European Conference on Space Debris, Darmstadt, Germany, April 22-25.
27. Vallado, D., Kelecy, T., **M. Jah**, (2012). "*Data Integrity in Orbital Data Fusion,"* 63rd International Astronautical Congress. Naples, Italy: International Astronautical Federation, September.
28. Früh, C. Kelecy T. and **Jah, M.**, (2012). *Attitude Dynamics Simulation of MLI Space Debris Objects in Geosynchronous Earth Orbit*, Proc. AIAA/AAS Astrodynamics Specialists Conference, Minneapolis, MN, August.
29. DeMars, K., Hussein, I., **Jah, M.**, Erwin, R.S., (2012). *The Cauchy-Schwarz Divergence for Assessing Situational Information Gain*, 15th International Conference on Information Fusion, Singapore, Singapore, July 9 – July 14.
30. DeMars, K., **Jah, M.,** (2012). *Initial Orbit Determination via Gaussian Mixture Approximation of the Admissible Region*, AAS Paper 12-260, 22nd AAS/AIAA Space Flight Mechanics Meeting, Charleston, SC, January 29 – February 2.
31. DeMars, K., **Jah, M.,** Cheng, Y., Bishop, R., (2012). *Methods for Splitting Gaussian Distributions and Applications within the AEGIS Filter*, AAS Paper 12-261, 22nd AAS/AIAA Space Flight Mechanics Meeting, Charleston, SC, January 29 – February 2.
32. Turnowicz, M., Jia, B., Ming, X., DeMars, K., **Jah, M.,** (2012). *Quadrature Methods for Orbit Uncertainty Propagation Under Solar Radiation Pressure*, AAS Paper 12-265, 22nd AAS/AIAA Space Flight Mechanics Meeting, Charleston, SC, January 29 – February 2.
33. DeMars, K., **Jah, M.,** (2012). *Evaluation of the Information Content of Observations with Application to Sensor Management for Orbit Determination*, Advances in the Astronautical Sciences, Vol. 142, pp. 3169-3188, Univelt, San Diego. AAS Paper 11-606, 2011.
34. Leve, F., **Jah, M.,** (2011). *Spacecraft Actuator Alignment Determination through Null Motion Excitation*, 62nd International Astronautical Congress, Cape Town, South Africa, October 2 – October 7.
35. DeMars, K., Bishop, R., **Jah, M.,** (2011). *A Splitting Gaussian Mixture Method for the Propagation of Uncertainty in Orbital Mechanics*, Advances in the Astronautical Sciences, Vol. 140, pp. 1419-1438, Univelt, San Diego. AAS Paper 11-201.
36. DeMars, K., Bishop, R., **Jah, M.,** (2011). *Space Object Tracking in the Presence of Attitude-Dependent Solar Radiation Pressure Effects*, AAS Paper 11-582, 2011 AIAA/AAS Astrodynamics Specialists Conference, Girdwood, AK, July 31 – August 4 .
37. Linares, R., **Jah, M.**, DeMars, K., (2011). *Improved Methods for Tracking and Characterizing Inactive Resident Space Objects*, 28th International Symposium for Space Sciences and Technology, Okinawa, Japan, June 3 – 9.
38. Hill, K., Sydney, Hamada, K., Cortez, R., Luu, K., Schumacher, P., Jr., **Jah, M.,** (2010). *Covariance-based Scheduling of a Network of Optical Sensors*, Advances in the Astronautical Sciences, Vol. 139, pp. 393-406, Univelt, San Diego. AAS Paper 10-325.
39. Giza, D., Singla, P., **Jah, M.,** (2010). *An Adaptive Gaussian Sum Filtering Approach for Orbit Uncertainty Estimation*, Part I, Advances in the Astronautical Sciences, Vol. 136, pp. 475-488, Univelt, San Diego. AAS Paper 10-132.
40. Hill, K., Sydney, P., Cortez, R., Naho'olewa, D., Houchard, J., Luu, K., **Jah, M.,** Schumacher, P., Jr., (2010). *Covariance-based Network Tasking of Optical Sensors*, Part

I, Advances in the Astronautical Sciences, Vol. 136, pp. 769-786, Univelt, San Diego. AAS Paper 10-150.

41. Wetterer, C., **Jah, M.,** Scro, K., (2010). *Kp Forecast Model Using Unscented Kalman Filtering*. Air Force Maui Optical and Supercomputing Site (AMOS) 2010 Conference, Wailea, Maui, Hawaii, September.
42. Linares, R., Crassidis, J., **Jah, M.**, Kim, H., (2010). *Astrometric and Photometric Data Fusion for Resident Space Object Orbit, Attitude, and Shape Determination Via Multiple-Model Adaptive Estimation*, AIAA-2010-8341, 2010 AIAA Guidance, Navigation, and Control Conference, Toronto, Canada, August 2-5.
43. DeMars, K., **Jah, M.K.,** (2009), *Passive Multi-Target Tracking with Application to Orbit Determination for Geosynchronous Objects*, Part I, Advances in the Astronautical Sciences, Vol. 134, pp. 89-100, Univelt, San Diego. AAS Paper 09-108.
44. DeMars, K., **Jah, M.,** Giza, D., Kelecy, T., (2009). *Orbit Determination Performance for High Area-to-Mass Ratio Space Object Tracking Using an Adaptive Gaussian Mixtures Estimation Algorithm.* 21st International Symposium on Space Flight Dynamics, Toulouse, France, September 28 - October 2.
45. Kelecy, T., **Jah, M.,** (2009). *Analysis of Orbit Prediction Sensitivity to Thermal Emissions Acceleration Modeling for High Area-to-mass Ratio (HAMR) Objects.* Air Force Maui Optical and Supercomputing Site (AMOS) 2009 Conference, Wailea, Maui, Hawaii, September.
46. Giza, D., Singla, P., **Jah, M.**, (2009). *An Approach for Nonlinear Uncertainty Propagation: Application to Orbital Mechanics.* AIAA-2009-6082, 2009 AIAA Guidance, Navigation, and Control Conference, Chicago, Illinois, August 10-13.
47. Kelecy, T., **Jah, M.,** (2009). *Analysis of Orbital Prediction Accuracy Improvements Using High Fidelity Physical Solar Radiation Pressure Models for Tracking High Area-to-Mass Ratio Objects*. 5th European Space Debris Conference, Darmstadt, Germany, March 30 – April 2.
48. **Jah, M.,** Kelecy, T., DeMars, K., (2008). *Orbit Determination Strategies Addressing The Search, Acquisition, And Characterization Of Geosynchronous Space Debris Objects*. 59th International Astronautical Congress, Glasgow, Scotland, September 29 – October 3.
49. **Jah, M.,** Madler, R., (2007). *Satellite Characterization: Angles and Light Curve Data Fusion for Spacecraft State and Parameter Estimation*. Air Force Maui Optical and Supercomputing Site (AMOS) 2007 Conference, Wailea, Maui, Hawaii, September.
50. Halsell, A., You, T., Highsmith, D., **Jah, M**., Graat, G., Demcak, S., Higa, E., Bhat, R., Long, S., Mottinger, N., (2007). *Mars Reconnaissance Orbiter Aerobraking Control*, Part II, Advances in the Astronautical Sciences, Vol. 127, pp. 2071-2088, Univelt, San Diego. AAS Paper 07-243.
51. Demcak, S., You, T., Highsmith, D., **Jah, M**., Graat, G., Halsell, A., Higa, E., Bhat, R., Long, S., Mottinger, N., (2007). *Mars Reconnaissance Orbiter Orbit Determination During Aerobraking*, Part II, Advances in the Astronautical Sciences, Vol. 127, pp. 2103-2118, Univelt, San Diego. AAS Paper 07-245.
52. Mottinger, N., You, T., Halsell, A., Highsmith, D., **Jah, M**., Graat, G., Demcak, S., Higa, E., Long, S., Bhat, R. (2006). *Launch Navigation Support for Mars Reconnaissance Orbiter*, Part II, Advances in the Astronautical Sciences, Vol. 124, pp. 1887-1909, Univelt, San Diego. AAS Paper 06-220.
53. Highsmith, D. E., You, T., Halsell, A., **Jah, M**., Demcak, S., Higa, E., Long, S. (2005). *Atmosphere Variability at Mars Reconnaissance Orbiter Science Orbit Altitudes Based On Mars Express Reconstructions*, Part II, Advances in the Astronautical Sciences, Vol. 120, pp. 1767-1787, Univelt, San Diego. AAS Paper 05-215.

54. **Jah, M.K**., Lisano, M.E. II (2004). *6-DOF Aerobraking Trajectory Reconstruction by use of Inertial Measurement Unit (IMU) Data for the Improvement of Aerobraking Navigation*, Part II, Advances in the Astronautical Sciences, Vol. 119, pp. 1733-1753, Univelt, San Diego. AAS Paper 04-214.
55. Lock, R., Xaypraseuth, P., Halsell, C. A., Bowes, A. L., Johnston, M. D., Lyons, D., Highsmith, D. E., **Jah, M. K**., You, T. (2004). *The Mars Reconnaissance Orbiter Mission Plan*, Part III, Advances in the Astronautical Sciences, Vol. 119, pp. 2629-2649, Univelt, San Diego. AAS Paper 04-269.
56. Highsmith, D. E., Konopliv, A. S., Han, D., **Jah, M. K**., Craig, D. E. (2004). *Mars Atmospheric Variability Above 250 km Altitude*, 18th International Symposium on Space Flight Dynamics, Germany, Munich, October 11-15.
57. Highsmith, D. E., Konopliv, A. S., Han, D., **Jah, M. K**., Craig, D. E. (2004). *Mars Express Interplanetary Navigation From Launch To Mars Orbit Insertion: The JPL Experience*, 18th International Symposium on Space Flight Dynamics, Germany, Munich, October 11-15.
58. You, T., Halsell, A., Highsmith, D., **Jah, M**., Graat, G., Demcak, S., Higa, E., Long, S., Bhaskaran, S., (2004). *Mars Reconnaissance Orbiter Navigation*, AIAA/AAS Astrodynamics Specialist Conference and Exhibit, Providence, Rhode Island, August 16-19.
59. Halsell, C. A., Bowes, A. L., Johnston, M. D., Lyons, D. T., Lock, R. E., Xaypraseuth, P., Bhaskaran, S. K., Highsmith, D. E., **Jah, M. K**. (2003). *Trajectory Design for the Mars Reconnaissance Orbiter Mission*, Part III, Advances in the Astronautical Sciences, Vol. 114, pp. 1591-1607, Univelt, San Diego. AAS Paper 03-211.
60. Bowes, A. L., Halsell, C. A., Johnston, M. D., Lyons, D. T., Lock, R. E., Xaypraseuth, P., Bhaskaran, S. K., Highsmith, D. E., **Jah, M. K**. (2003). *Primary Science Orbit Design for the Mars Reconnaissance Orbiter Mission*, Part III, Advances in the Astronautical Sciences, Vol. 114, pp. 1607-1625, Univelt, San Diego. AAS Paper 03-212.
61. **Jah, M.K**. (2001). *A Proposed Use of Accelerometer Data for Autonomous Aerobraking at Mars*, Part II, Advances in the Astronautical Sciences, Vol. 109, pp. 1247-1256, Univelt, San Diego. AAS Paper 01-386.
62. **Jah, M.K**., Potterveld, C., Rustick, J., Madler, R. (1999). *Use of Lunar Gravity Assists for Earth Orbit Plane Changes*, Part I, Advances in the Astronautical Sciences, Vol. 102, pp. 95-107, Univelt, San Diego. AAS Paper 99-107.
63. Ely, T. A., Anderson, R., Bar-Sever, Y. E., Bell, D., Guinn, J., **Jah, M**., Kallemeyn, P., Levene, E., Romans, L., Wu, S., (1999). *Mars Network Constellation Design Drivers and Strategies*, Paper AAS 99-301, AAS/AIAA Astrodynamics Specialist Conference, Girdwood, Alaska, August 16-19.
64. **Jah, M.K**., (1998). *Simulated Lunar Design and Modeling Assisted by Satellite Tool Kit (STK)*, 6th International Conference and Exposition on Engineering, Construction, and Operations in Space, held in Albuquerque, NM, April 26-30.

e. Invited Lectures, Papers, Radio Interviews, Podcasts, and Panels

1. Future In-Space Operations (FISO) seminar, 1 Mar 2017. *Space Traffic and the Tragedy of the Commons*. http://spirit.as.utexas.edu/%7Efiso/telecon.htm
2. 3rd ORF Kalpana Chawla Space Dialogue, 15-18 Feb 207, New Delhi, India. Invited Speaker and Panelist.
3. University of Colorado at Boulder, Aerospace Engineering Sciences Department, 2 Feb 2017. *Adaptive Entropy-based Gaussian-mixture Information Synthesis for Improved Space Situational Awareness.*

4. University of Texas at Austin, Aerospace Engineering and Engineering Mechanics Department, 28 Oct 2016. *Space Traffic Management and the Tragedy of the Commons.*
5. The Space Show, http://thespaceshow.com/show/18-oct-2016/broadcast-2796-dr.-moriba-jah, Oct 2016.
6. TEDxDayton, Dayton, OH, Oct 2016. *Space Traffic and Avoiding the Tragedy of the Commons.*
7. International Symposium for Personal and Commercial Spaceflight, Las Cruces NM, Oct 2016. Keynote Speaker.
8. Space Advocates Seminar, US. House Science Committee, Washington, D.C., Oct 2016. *The Role of Academia in Space Situational Awareness and Global Space Traffic Management.*
9. NPR Arizona Science: *Episode 48 Rules of the Road are Needed in Outer Space*, https://radio.azpm.org/arizonascience/, Sep 2016.
10. 2nd Space Technology and Investment Forum, San Francisco CA, July 2016. Keynote Speaker.
11. NATO SCI-292-LS Lecture Series, Lead Lecturer, Ankara (Turkey), Rome (Italy), Munich (Germany), and Washington D.C.(USA), June-July 2016. *Space Domain Awareness.*
12. Defense Strategies Institute (DSI) 2nd Annual Space Resiliency Summit, Alexandria VA, June 2016. Keynote Speaker.
13. 32nd Space Symposium Panelist on Congestion in Space, Colorado Springs CO, Apr 2016.
14. Embry-Riddle Aeronautical University Honors Lecture, Prescott, AZ. Mar 2016.
15. Martin Luther King Day Invited Speaker: Army Research Laboratory, Adelphi MD, Jan 2016.
16. Institute for Defense Analyses, Science and Technology Policy Institute: Invited lecture on Space Object Behavioral Sciences and Applications to Space Situational Awareness and Space Traffic Monitoring, Jan 2016.
17. 1st Air Force Research Laboratory (AFRL) Inspire talks, Dayton OH Oct 2015. *Space Junk: The Unknown Orbital Iceberg Equivalent.*
18. 3rd Australian Space Situational Awareness Meeting, Canberra, Australia Sep 2015. US Keynote Speaker.
19. Space Situational Awareness 2015, Maryland, May. *Chair, Keynote Speaker, and Panelist.*
20. Space Security, Wilton Park, West Sussex, UK, Mar 2015. US Space Situational Awareness technical expert.
21. Short Course on Orbital Mechanics and Space Surveillance, Feb 2015; University of New South Wales/Australian Defence Force Academy [UNSW/ADFA] (Canberra, Australia)
22. Space Situational Awareness 2014, London, UK, Nov. *US Representative Panelist.*
23. TEDxABQ Salon, Albuquerque, NM Aug 2014. *Space Junk: The Unknown Orbital Iceberg Equivalent.*
24. AIAA Space 2014, San Diego, CA Aug 2014. *Mutual Application of Joint Probabilistic Data Association, Filtering, and Smoothing Techniques for Robust Multiple Space Object Tracking"* Co-authors: J. Stauch, J. Baldwin, T. Kelecy, K. Hill.
25. 2nd Australian Space Situational Awareness Meeting, Canberra, Australia Jun 2014. US Keynote Speaker.
26. 2nd IAA Conference on Dynamics and Control of Space Systems, Rome, Italy Mar 2014. *Special Panel on Astrodynamics Needs in Space Situational Awareness and the Air Force Space Command's Astrodynamics Innovation Committee*.

27. 24th AAS/AIAA Space Flight Mechanics Meeting, Santa Fe, NM Jan 2014. *Special Panel on Air Force Space Command's Astrodynamics Innovation Committee*.
28. 1st Australian Space Situational Awareness Meeting, Canberra, Australia Apr 2013. US Keynote Speaker.
29. 2012 AIAA GNC/Astrodynamics Conference, Minneapolis, MN Aug 2012. *Special Panel on Space Situational Awareness.*
30. 39th COSPAR Scientific Assembly, Mysore, India. July 2012. US Keynote Speaker. *Special Panel on Space Situational Awareness.*
31. 2011 Students for the Exploration and Development of Space (SEDS) conference, Boulder, CO Oct 2011. *Special Panel on Space Debris.*
32. 28th International Symposium for Space Sciences and Technology, Okinawa, Japan. June 2011. *Special Panel on Space Debris.*
33. 2011 European Geophysics Union Meeting, Vienna, Austria. May 2011. *Improved Methods for Tracking and Characterizing Inactive Resident Space Objects*.
34. University College London, London, Great Britain. October 2009. *Orbit Determination Performance for High Area-to-Mass Ratio Space Object Tracking Using an Adaptive Gaussian Mixtures Estimation Algorithm.*
35. University of Bern, Bern, Switzerland. September 2009. *Orbit Determination Performance for High Area-to-Mass Ratio Space Object Tracking Using an Adaptive Gaussian Mixtures Estimation Algorithm.*
36. 1st TechHui Conference, O'ahu, Hawai'i. Keynote Speaker. July 2009. *Astrodynamics and the Maui Space Surveillance Systems Branch*.
37. Universidad Simon Bolivar, Caracas, Venezuela. June 2009. *Introduction to Astrodynamics and Orbit Determination*.
38. Liceo Militar Pedro Ma. Ochoa Morales, Los Teques, Venezuela. June 2009. *Introduction to Astrodynamics and Orbit Determination*.
39. 19th AAS/AIAA Space Flight Mechanics Meeting, Savannah, GA. February 2009. *Advanced Sciences & Technology Research Institute for Astrodynamics (ASTRIA)*.
40. NASA Jet Propulsion Laboratory. November 2007. *Air Force Maui Optical and Supercomputing Site (AMOS)*.

f. Faculty and Postdoctoral Fellows Supervised

1. Prof. Mark Psiaki [Cornell]; National Research Council (2014).
2. Prof. James Turner [Texas A&M]; Air Force Summer Faculty Fellowship (2013).
3. Prof. Dilmurat Azimov [Univ. of Hawaii]; Air Force Summer Faculty Fellowship (2013).
4. Prof. Troy Henderson [Virginia Tech]; Air Force Summer Faculty Fellowship (2012).
5. Prof. Carolin Früh [Purdue]; National Research Council (2011 – 2013).
6. Prof. Yang Cheng [Mississippi State University]; Air Force Summer Faculty Fellowship (2011 - 2013).
7. Prof. Kyle DeMars [Missouri Univ. of Sci. & Tech.]; National Research Council (2011 – 2013).
8. Prof. David Geller [Utah State University]; Air Force Summer Faculty Fellowship (2010).
9. Prof. C. Jack Wetterer [U.S. Air Force Academy]; Sabbatical (2009).
10. Prof. Ronald Madler [Embry-Riddle Aeronautical University]; Summer Fellow (2007).

g. Graduate Students Supervised

1. Vishnuu Mallik [University of Arizona] (2016 – present)
    a. Advisor: Prof. Moriba Jah
2. Antonella Albuja [University of Colorado]; Space Vehicles Intern (2013)

    a. Advisor: Prof. Daniel Scheeres
3. Austin Probe [Texas A&M]; Air Force Summer Faculty Fellowship (2013)
    a. Advisor: Prof. John Junkins/James Turner
4. Robbie Robertson [Virginia Tech]; Air Force Summer Faculty Fellowship (2012)
    a. Advisor: Prof. Troy Henderson
5. Richard Linares [University of Buffalo]; Space Scholars Program (2010 - 2012)
    a. Advisor: Prof. John Crassidis
6. Steve Gehly [University of Colorado at Boulder]; Space Scholars Program (2012)
    a. Advisor: Prof. Penina Axelrad
7. Eamonn Moyer [University of Buffalo]; Space Scholars Program (2012)
    a. Advisor: Prof. Puneet Singla
8. Brien Flewelling [Texas A&M]; SMART Fellowship Program (2011)
    a. Advisor: Prof. John Junkins
9. Ryan Weismann [Texas A&M]; SMART Fellowship Program (2011)
    a. Advisor: Prof. K. Terry Alfriend
10. Matthew Turnowicz [Mississippi State University]; Air Force Summer Faculty Fellowship (2011-2012)
    a. Advisor: Prof. Yang Cheng
11. Aaron Rosengren [University of Colorado at Boulder]; Space Scholars Program (2011)
    a. Advisor: Prof. Daniel Scheeres
12. Jill Tombasco [University of Colorado at Boulder]; NDSEG Fellowship Program (2009, 2010, 2011)
    a. Advisor: Prof. Penina Axelrad
13. Daniel Giza [University of Buffalo]; Directed Energy Scholars Program (2009)
    a. Advisor: Prof. Puneet Singla
14. Kyle DeMars [University of Texas at Austin]; Directed Energy Scholars Program (2008, 2009)
    a. Advisor: Prof. Robert Bishop

h. Doctoral Committees

1. Vitali Braun, Technische Universitat Braunschweig (2016).
2. Ryan Coder, Georgia Institute of Technology (2016).
3. Antonella Albuja, University of Colorado (2015).
4. Richard Linares, University of Buffalo (2014).
5. Aaron Rosengren, University of Colorado at Boulder (2014).
6. Jill Tombasco, University of Colorado at Boulder (2011).
7. Kyle DeMars, University of Texas at Austin (2010).

i. Scholarly/Community Services and Editorial Boards

1. Invited External Reviewer for Montana NASA EPSCoR Research Award Selection (2016).
2. Guest Editor, AIAA Journal of Guidance, Control, and Dynamics Special Issue: Space Domain Awareness.
3. Associate Editor, IEEE Transactions on Aerospace and Electronic Systems.
4. Associate Editor, IEEE Aerospace and Electronic Systems Magazine.
5. Review Process Manager, Journal of Information Fusion (Elsevier).
6. Editor, Advances in the Astronautical Sciences, Vol. 140.
7. Reviewer, AIAA Journal of Guidance, Control, and Dynamics.
8. Reviewer, Acta Astronautica (Elsevier).
9. Reviewer, Advances in Space Research (Elsevier).

10. Member, International Astronautical Federation (IAF) Astrodynamics Technical Committee (2014 - Present).
11. Permanent Member, International Academy of Astronautics (IAA) Space Debris Technical Committee (2014 - Present).
12. Chair, AAS Space Surveillance Technical Committee (2009 – 2016).
13. Chair, AIAA Astrodynamics Technical Committee (Member 2012 – Present).
14. Member, NSSDF Technical Committee (2012 – Present).
15. Member, AAS Space Flight Mechanics Technical Committee (2006 – 2011).
16. Technical Chair, 21st AAS/AIAA Space Flight Mechanics Meeting (2011).
17. Technical Committee Member, International Society of Information Fusion Conference (2010, 2012, 2013).
18. National Chairperson, Space Debris, 35th Annual AAS Guidance and Control Conference (2012).
19. Organizer and Moderator, 1st AAS Space Surveillance Workshop, London, UK (2011).

j. Synergistic Activities

Designed, developed, and led multi-disciplinary team for modular space situational awareness software tool (Ananke) focused upon space object detection, tracking, identification, and characterization via astrometric and photometric data fusion.

Co-Designing and co-developing next generation modular astrodynamics software tool suite with NASA Goddard Space Flight Center called General Mission Analysis Tool (GMAT), as a multi-agency tool that will support R&D and operations, to include covariance analyses, Monte Carlo analyses, multiple estimation strategy and automated space surveillance support.

Developed 6-Degree-of-Freedom Unscented Kalman Filter software for processing inertial sensor data in order to estimate for spacecraft states and modeling parameters (JPL New Technology Report NTR-43677).

Designed and developed the Mars Reconnaissance Orbiter in-flight attitude control system thruster calibration, and used the results to refine non-gravitational acceleration models due to the effects from angular momentum desaturation events (JPL Memo MRO-NAV-2006-01).

k. Languages & Other Skills

1. Fluent in Spanish and French. Understand and speak some Italian.
2. Significant experience in multi-cultural/multi-national work
    a. Lead on several US multi/bi-lateral agreement projects related to space situational awareness (AUS, CAN, UK, ITA, GER, FRA, SWE) as well as NATO SCI-279-TG activity.
    b. Supported spacecraft navigation operations for the Japanese Space Agency (JAXA) on the Muses-C mission to asteroid Itokawa and provided navigation operations support for the European Space Agency (ESA) on Mars Express, their first interplanetary mission including travel abroad where appropriate.

l. Organization, honoraries, honors, and offices held

1. Fellow *International Association for the Advancement of Space Safety (IAASS).*
2. Fellow *Air Force Research Laboratory (AFRL).*
3. Fellow *American Astronautical Society (AAS).*
4. Fellow *Royal Astronomical Society (RAS).*
5. Associate Fellow *American Institute of Aeronautics and Astronautics (AIAA).*
6. Senior Member *Institute of Electrical and Electronics Engineers (IEEE).*

7. Member *International Society for Information Fusion (ISIF).*
8. Member *Sigma Gamma Tau* National Aerospace Engineering Honorary.
9. 2016 *University of Colorado Distinguished Engineering Alumni Award (DEAA).*
10. 2014 *University of New South Wales (Canberra, AUS): Rector Funded Visiting Fellow.*
11. 2013 *AFRL/RV Technology Transfer/Transition Achievement Award*.
12. 2013 *AFRL International Award.*
13. *Hayabusa Certificate of Appreciation (2010)*: "in recognition of your significant contributions to the completion of Hayabusa's round trip space mission in 2010."
14. 2009 *AFRL R. Earl Good Award* "for significant team contributions to the AFRL mission or image outside of AFRL and for accomplishments that have had a significant impact and enhanced the creditability of AFRL."
15. 2009 *NASA Group Achievement Award* for the Nanosail-D mission support.
16. 2007 *NASA Space Act Award* "for the creative development of a scientific contribution which has been determined to be of significant value in the advancement of the space and aeronautical activities of NASA, and is entitled: Inertial Measurements for Aeroassisted Navigation (IMAN)".
17. 2005 *NASA Group Achievement Award* for the flawless navigation of the Mars Reconnaissance Orbiter to Mars.
18. 2001 *NASA Group Achievement Award* and *Aviation Week & Space Technology Laurel Award* for the superb navigation of the Mars Odyssey spacecraft to Mars.
19. Adviser *National Research Council.*
20. Adviser *Air Force Summer Faculty Fellowship Program.*
21. AIAA Representative, U.S. Delegation to the United Nations Committee On Peaceful Uses of Outer Space (UN-COPUOS); Vienna, Austria.
22. Chair *NATO SCI-279-TG "Technical Considerations Enabling a Common NATO Space Domain Awareness Operating Picture".*
23. Lead *NATO SCI-ET-003 "Systems Integration and Data Fusion Concepts to Support a common NATO Space Situational Awareness Operating Picture".*
24. Member *Space Environment Research Centre (SERC) Research Management Committee;* Australia.

m. Grants, Contracts, and Funding Support

- Totals (including any pending negotiations): ~$52,500,000
  Jah's Share Career:_____ ~$28,850,000

While in rank at The University of Arizona:

1. "Near Earth Object – Advanced Detection Identification Characterization and Tracking (NEO-ADICT)," NASA Goddard Space Flight Center via SGT IDIQ, $40,000 (Jah's share $40,000), Sep 2016 – May 2017, Principal Investigator.
2. "Development of a GEO Space Object Catalog," Air Force Research Laboratory via Applied Defense Solutions, $250,000 (Jah's Share $150,000), Sep 2016 – Dec 2017, Principal Investigator.
3. "Multi-INT Analytics to Characterize Space Object Behavior for Space Situational Awareness," Air Force Research Laboratory via BAE Systems, $291,000 (Jah's Share $291,000), Jan 2017 – Jan 2020, Principal Investigator.
4. "Hallmark – Testbed," DARPA via Ball Aerospace, $216,000 (Jah's Share $216,000), Jan 2017 – Jan 2018, Principal Investigator.
5. "Space Object Detection, Tracking, Identification, and Characterization," US Air Force via Applied Defense Solutions, $120,000 (Jah's Share $120,000), Jan 2017 – Jan 2018, Principal Investigator.

While at the Air Force Research Laboratory:

6. DARPA Orbit Outlook Program, $10M (Jah's Share $5M), Technical Lead (2014-2015).
7. Various Air Force SBIR/STTR Programs, $15M (Jah's Share $15M), Technical Lead (2010-2015).
8. DARPA Ibex Program, $20M (Jah's Share $1.5M), Technical Lead and PI (2010-2012).
9. Satellite and Missile Systems Center (SMC), $1.5M (Jah's Share $1.5M), PI (2010-2012).
10. Air Force Office of Scientific Research (AFOSR), $1.5M (Jah's Share $1.5M), PI (2009-2013).
11. AFOSR International, $1.5M (Jah's Share $1.5M), Technical Lead (2009-2013).
12. National Research Council (NRC) Research Associateship, $2M (Jah's Share $2M), Adviser (2009-2015).