

Curriculum Vitae – Luis Zea, Ph.D.

University of Colorado / 429 UCB ECAE 1B02
Smead Department of Aerospace Engineering Sciences
Boulder, CO 80309

Phone: +1 (303) 492-3525
E-mail: Luis.Zea@colorado.edu
Web: <http://www.colorado.edu/faculty/zea-luis/>

Professional Experience

2018-present Assistant Research Professor, BioServe Space Technologies
2015-2018 Research Associate, BioServe Space Technologies
2015 Visiting Scientist, UFMG, Brazilian Space Agency-funded
2014-present Professor (CubeSat Project), Universidad del Valle de Guatemala
2014 Visiting Scientist, German Aerospace Center
2010-2015 Graduate Research Assistant, BioServe Space Technologies
2008-2010 Heat Transfer Engineer, Siemens Energy, Inc.
2008 Research Project Manager, University of Central Florida
2006-2008 Graduate Research Assistant, University of Central Florida
2004-2006 Mechanical Engineer, ExxonMobil

Education

2010-2015	Ph.D.	Aerospace Engineering	University of Colorado, Boulder
2006-2008	M.S.	Aerospace Engineering	University of Central Florida
2001-2005	B.S.	Mechanical Engineering	Universidad del Valle de Guatemala

Awards & Recognitions

2018 Thora Halstead Young Investigator Award, American Society of Gravitational and Space Research
2016 ISS Young Professionals Plenary, ISSRDC
2015 Among the 25 most influential people in Central America, Forbes Mexico
2015 Emerging Space Leader Award, International Astronautics Federation (IAF)
2015 Next Generation Plenary, IAF
2014 Student Investigator Spaceflight Award, CASIS
2014 Research Fellowship for Doctoral Candidates and Young Scientists, DAAD
2013 Orville and Wilbur Wright Graduate Award, AIAA
2013 Illustrious Citizen Award, Grupo Universales, Guatemala
2013 Aerospace Graduate Student Scholarship, CU
2013 International Space Exploration Strategy Group, MIT/Skoltech
2012 Person of the Year: Science & Technology Category, Corporación de Noticias
2011 Graduate Student Service Award, CU
2010 Second Place, Young Professional Activity Award, AIAA
2010 Extraordinary Performance Award, Siemens Energy, Inc.
2008 First Place, 3rd Annual Florida University Satellite (FUNSAT) Design Competition
2005 Outstanding Work Special Recognition, ExxonMobil
2004 Distinguished Student Diploma, Universidad del Valle de Guatemala (UVG)
2003 Distinguished Student Diploma, UVG

Space-Based Research Experience

Experience includes project management, engineering R&D, safety, STEM outreach, and/or science on thirteen ISS experiments: Micro-4 (STS-135, Yeast), Micro-5 (SpaceX-5, *Salmonella* and *C. elegans*), Butterflies in Space (HTV-3, butterflies STEM project), Antibiotic Effectiveness in Space AES-1 (Orbital-1, *E. coli*), OsteoOmics (SpaceX-9, preosteoblasts), HeartCells (SpaceX-9, human-induced pluripotent stem cells), Nanobiosym (SpaceX-10, MRSA), Antibody Conjugates (Orbital-7, cancer cells), Magnetic 3D Cultures (Orbital-7, cancer cells), Micro-11 (SpaceX-14, human and bovine sperm), and Micro-12 (Orbital-8,

Shewanella oneidensis). Luis is also the Principal Investigator of the Biofilm in Space project, scheduled to launch to ISS in late 2018.

Research

Characterization of Biofilm Formation, Growth and Gene Expression in Microgravity

Investigation on biofilm formation on aerospace- and medically-relevant materials; includes different material nanotopographies and bacterial and fungal organisms. Data acquired via morphological (e.g. biofilm architecture and cell ultrastructure) and transcriptomic (e.g. resistomics analyses) assays. Experiment planned to be launch to ISS on late 2018

Characterization of Clinically- and Spaceflight-Relevant Bacteria and Fungi and Drug Effectiveness under Simulated Lunar, Martian, and Micro-Gravities

This project aims to characterize changes on cell growth dynamics and cell aggregation as a function of gravitational regime (simulated micro-, 1/6 and 1/3 g). This is complemented by gene expression analyses focused on the drug-resistance-associated genes (resistome) as well as those responsible for bacterial virulence. This systematic microbial study includes ten commensal, opportunistic, and pathogenic bacterial and fungal strains This study has a second component that focuses on determining if there are changes on the concentrations of drugs needed to inhibit microbial growth at different gravitational regimes.

Antibiotic Effectiveness in Space

Study on bacterial growth under different concentrations of antibiotic in space. Data was acquired via morphological (e.g. light, FIB/SEM, and TEM microscopy) and transcriptomic (differential gene expression) analyses. Experiment performed on ISS in 2014. Was the basis of my PhD dissertation.

CubeSat Development

Development of Guatemala's first satellite, a 1U CubeSat to validate a multispectral sensor prototype. Selected in 2017 by the United Nations Office of Outer Space Affairs (UNOOSA) and the Japanese Space Agency (JAXA), to be launched and deployed from ISS per the 'KiboCUBE Opportunity' (world-wide competition)

Publications

Peer-Reviewed Journal Articles

1. **Zea, L.**, Nisar, Z., Rubin, P., Cortesão, M., Luo, J., McBride, S. A., Moeller, R., Klaus, D., Mueller, D., Varanasi, K., K., Muecklich, F., Stodieck, L. (2018). Design of a spaceflight biofilm experiment. *Acta Astronautica* 148 (294-300). <https://doi.org/10.1016/j.actaastro.2018.04.039>
2. Aunins, T. R., Erickson, K. E., Prasad, N., Levy, S. E., Jones, A., Shrestha, S., Mastracchio, R., Stodieck, L., Klaus, D., **Zea, L.**, Chatterjee, A. (2018). Spaceflight Modifies *Escherichia coli* Gene Expression in Response to Antibiotic Exposure and Reveals Role of Oxidative Stress Response. *Frontiers in Microbiology*, 9, 310.
3. **Zea L.**, Larsen M, Estante F, Qvortrup K, Moeller R, Dias de Oliveira S, Stodieck L and Klaus D, (2017) Phenotypic Changes Exhibited by *E. coli* Cultured in Space. *Front. Microbiol.* 8:1598. doi: 10.3389/fmicb.2017.01598
4. **Zea, L.**, Prasad, N., Levy, S., Stodieck, L., Jones, A., Shrestha, S., Klaus, D., (2016). A Molecular Genetic Basis to Bacterial Behavior in Space, *PLoS ONE* 11(11): e0164359
5. **Zea, L.**, Ayerdi, V., Argueta, S., Muñoz, A. (2016). A Methodology for CubeSat Mission Selection, *Journal of Small Satellites, JoSS*, Vol. 05, No. 03, pp. 483–511
6. **Zea, L.**, Cooper, D., Kumar, R., (2011) Hydrogen Sulfide Absorption Phenomena in Brine, *SPE Journal*, v.16, number 4, pp 931-939
7. **Zea, L.**, Kumar, R., (2010) Surface EVA Emergency Scenario Management: Tools, Procedures, and Geologically-Related Implications, *Acta Astronautica*, v.67, iss.1-2, p.60-70

Theses

1. **Zea, L.**, Phenotypic and Gene Expression Responses of *E. coli* to Antibiotics during Spaceflight, Ph.D. Thesis, University of Colorado, Boulder, CO, 2015
2. **Zea, L.**, Experimental Analysis of the Hydrogen Sulfide Absorption Phenomena in Brine/Oil Mixtures as a Function of System Pressure and H₂S Concentrations, M.S. Thesis, University of Central Florida, Orlando, FL, 2008

Peer-Reviewed Conference Papers

1. **Zea, L.**, Over, S., Klaus, D., Tanner, J., Stroud, K., Development of a Cockpit Architecture for the Dream Chaser Orbital Vehicle, 42nd International Conference on Environmental Systems (ICES), San Diego, CA, July 15-19, 2012

Conference Papers

1. Nisar, Z., Ganguly, S., Stodieck, L., **Zea, L.**, Defining a Spaceflight Biofilm Experiment Through Comprehensive Assessment of Material, Media, and Hardware Biocompatibility, IAC-18,A2,7,14,x45464, 69th International Astronautical Congress, Bremen, Germany, 1-5 October 2018
2. Cortesao, M., Rubin, P., Mucklich, F., Hellweg, C., Stodieck, L., Klaus, D., Moeller, R., **Zea, L.**, Controlling Spaceflight Fungal Biofilms: the Search for Antimicrobial Surfaces, IAC-18,A2,7,15,x46729, 69th International Astronautical Congress, Bremen, Germany, 1-5 October 2018
3. Martínez, M., González, D., Rodríguez, D., Birnie, J., Bagur, J.A., Paz, R., Miranda, E., Solórzano, F., Esquit, C., Gallegos, J., Álvarez, E., Ayerdi, V.H., **Zea, L.** (2018) Guatemala's Remote Sensing CubeSat - Tools and Approaches to Increase the Probability of Mission Success. 32nd Annual AIAA/USU Conference on Small Satellites, Logan, Utah, August 4-10, 2018
4. Gómez Jenkins, M., García, B., Chaves Jimenez, A., García, D., Carvajal-Godínez, J., Lara, J., **Zea, L.**, Mechanism of Cooperation for the Development of a Central American International Space Project – A Regional CubeSat, IAC-17-E3.1.11, 68th International Astronautical Congress (IAC), Adelaide, Australia, 25-29 September 2017
5. Molina, J.C., Ayerdi, V., **Zea, L.** (2016). Attitude Control Model for CubeSats, 2nd Latin American CubeSat Workshop, Florianopolis, Brazil, February 28 - March 2, 2016
6. **Zea, L.**, Drug Discovery and Development in Space, IAC-15-A1.8x27627, 66th International Astronautical Congress, Jerusalem, Israel, October 12-16, 2015
7. **Zea, L.**, Microbiological Experiments Onboard CubeSats – A Review and Prospects, IAA-BR-14-13-03, 1st Latin American IAA CubeSat Workshop, Brasilia, Brazil, December 8-11, 2014
8. Miranda, E., Flores, J., Molina, J.C., Perez, J., Ayerdi, V., **Zea, L.**, Design and Development of Guatemala's first CubeSat, IAA-BR-14-05-06, 1st Latin American IAA CubeSat Workshop, Brasilia, Brazil, December 8-11, 2014
9. **Zea, L.**, Ayerdi, V., Argueta, S., Muñoz, A., CubeSat Applications and their Potential Benefits – A Methodology for Mission Selection, IAA-BR-14-03-02, 1st Latin American IAA CubeSat Workshop, Brasilia, Brazil, December 8-11, 2014
10. Bandla, S., Cheetham, B., Hakeem, R., **Zea, L.**, Applying Insights of Game Theory to the Microgravity Utilization Market, 65th International Astronautical Congress, Toronto, Canada, September 29 - October 3, 2014
11. Caparelli E., ... **Zea, L.**, Battat, J., Evaluating International Collaboration for Human Exploration Beyond LEO, IAA Space Exploration Conference, Washington DC, USA, January 9 2014
12. Hammond, T.G., Allen, P.L., **Zea, L.**, Fanchiang, C., Nislow, C. and Stodieck, L.S., Specialized Hardware in Support of Yeast Genomics Studies on Board the Space Shuttle and ISS, 1st International Space Station Research and Development Conference, Denver, CO, June 26-28, 2012
13. **Zea, L.**, Impact of Generator Rating Increase, Ambient Pressure and Coolant Composition and Temperature on Power Generator Heat Exchangers, ASME Power 2010 Conference, Chicago, IL, July 13-15, 2010

Conference Abstracts and Posters

1. Tash, J., Yarns, E.M., Piper, S.S., Ngo, L., Laundry, E., Julo, M., Stodieck, L., **Zea, L.**, Karouia, F., Blanco, G., Micro-11: Human and Bovine Sperm Function in Microgravity on the ISS, 34th Annual Meeting of the American Society for Gravitational and Space Research (ASGSR), October 31-November 3, 2018, Washington, D.C
2. **Zea, L.**, Estante, F., Rosengren, A., Stodieck, L., Klaus, L. (2018). Determining an Appropriate Clinostat Rotational Speed, 34th Annual Meeting of the American Society for Gravitational and Space Research (ASGSR), October 31-November 3, 2018, Washington, D.C
3. Schauer, R., Ganguly S., Nisar, Z., Cortesao, M., Moeller, R., Luo, J., Muecklich, F., McBride, S.A., Varanasi, K., Sato, K., Gorti, S., Klaus, D., Stodieck, L., **Zea, L.** (2018). Tests in Preparation for a Spaceflight Fungal and Bacterial Biofilm Experiment, 34th Annual Meeting of the American Society for Gravitational and Space Research (ASGSR), October 31-November 3, 2018, Washington, D.C
4. García, I., Farchi, D., Álvarez, C., Sunu, K., Pennington, P., **Zea, L.** (2018) La vida y muerte de Klebsiella pneumoniae en microgravedad simulada: Comportamiento a distintos pH y concentraciones de Carbenicilina, 1er Congreso Nacional de Biotecnología en Guatemala, 8-10 Octubre, 2018, Ciudad de Guatemala, Guatemala
5. Pérez, C., Sandoval, P., Argueta, S., Torres, M., Pennington, P., **Zea, L.** (2018) Resistencia de Staphylococcus aureus a carbenicilina en condiciones simuladas de microgravedad, 1er Congreso Nacional de Biotecnología en Guatemala, 8-10 Octubre, 2018, Ciudad de Guatemala, Guatemala
6. Flores, P., Zaghi, M., López, I., **Zea, L.** (2018) Determination of Growth Curves of Klebsiella pneumoniae under Earth Gravity at Different pH Values and Simulated Microgravity, 1er Congreso Nacional de Biotecnología en Guatemala, 8-10 Octubre, 2018, Ciudad de Guatemala, Guatemala
7. Cortesao, M., de Haas, A., Laue, M., Hemmersbach, R., Hellweg, C., Venkateswaran, K., **Zea, L.**, Moeller, R., Fungi in space: Implications for astronaut health and planetary protection, EANA 2018, Berlin, Germany, 24-28 September 2018
8. **Zea, L.**, Chaves, A., Ayerdi, V., Carvajal, J. (2018). A Multinational CubeSat for Forest Monitoring. United Nations/Brazil Symposium on Basic Space Technology, Natal, Brazil, 11-14 September 2018
9. Chaves, A., Carvajal-Godinez, J., **Zea, L.**, Mission Concept Review of an International Cooperative Space Project: a Mesoamerican CubeSat, United Nations/Brazil Symposium on Basic Space Technology, Natal, Brazil, 11-14 September 2018
10. Kidder, L.S., **Zea, L.**, Countryman, S.M., Stodieck, L.S., Hammer B.E. (2018). A Novel Protocol Permitting the Use of Frozen Cell Cultures in Low Earth Orbit. ISSRDC Conference, San Francisco, CA, July 23-26, 2018 (Poster and abstract)
11. Cortesao, M., Luo, J., Müller, D., Nisar, Z., Rubin, P., Muecklich F., Hemmersbach, R., Hellweg, C.E., **Zea, L.**, Moeller, R. "Biofilm in Space (BFS): Designing a Spaceflight Experiment". 42nd COSPAR Scientific Assembly, Pasadena, CA, July 14-22, 2018 (Oral presentation) and Biofilms 8, Aarhus, Denmark, May 27-29, 2018 (Poster)
12. **Zea, L.** (2018). Chapines trabajando en proyectos espaciales alrededor del mundo. CONVERCIENCIA, Guatemala City, Guatemala, July 23-27, 2018 (Abstract)
13. **Zea, L.** (2018). Cómo estudiar en el exterior sin pagar, y la importancia de las publicaciones científicas. CONVERCIENCIA, Guatemala City, Guatemala, July 23-27, 2018 (Abstract)
14. **Zea, L.** (2018). Preparando un experimento de biopelículas microbianas a ser llevado a cabo en la Estación Espacial Internacional. CONVERCIENCIA, Guatemala City, Guatemala, July 23-27, 2018 (Abstract)
15. Ganguly, S., **Zea, L.**, Characterization of P. aeruginosa Growth Patterns Under Varying Gravitational Conditions, Anschutz Medical Campus Master of Science in Modern Human Anatomy Capstone Presentation Sessions, University of Colorado, Denver, CO, April 17, 2018
16. Niederwieser, T., **Zea, L.**, Anthony, J., Stodieck, L. (2018). Basic and Applied Algal Life Support System Research on Board the Deep Space Gateway. NASA's Deep Space Gateway Workshop, February 27-March 1, 2018, Denver, CO (Abstract)
17. **Zea, L.**, Niederwieser, T., Anthony, J., Stodieck, L. (2018). Utilizing the Deep Space Gateway to Characterize DNA Damage due to Space Radiation and Repair Mechanisms. NASA's Deep Space Gateway Workshop, February 27-March 1, 2018, Denver, CO (Abstract)

17. Anthony, J., Niederwieser, T., **Zea, L.**, Stodieck, L. (2018). Key Challenges for Life Science Payloads on the Deep Space Gateway. NASA's Deep Space Gateway Workshop, February 27-March 1, 2018, Denver, CO (Abstract)
18. Nisar, Z., Stodieck, L., **Zea, L.**, Ground Testing of Biofilm Formation on Spaceflight-Relevant Materials, American Society for Gravitational and Space Research (ASGSR), Seattle, WA, October 24-28, 2017
19. Cortesao, M., Luo, J., Mueller, D., Nisar, Z., Muecklich, F., Hemmersbach, R., Hellweg, C., **Zea, L.**, Moeller, R., Growth and biofilm formation of *Penicillium chrysogenum* in simulated microgravity, American Society for Gravitational and Space Research (ASGSR), Seattle, WA, October 24-28, 2017
20. J.S. Tash, F. Karouia, M.C. Schiewe, L.S. Stodieck, **L. Zea**, E.M. Yarns. MICRO-11: Spaceflight-Altered Motility Activation and Fertility-Dependent Responses in Sperm, International Space Station Research & Development Conference, Washington, D.C., July 17-20, 2017
21. García, B., Lara, J., Ayerdi, V., **Zea, L.**, Manufacturing a CubeSat Structure at an Academic Makerspace, 2nd International Symposium on Academic Makerspaces (ISAM), Cleveland, USA, September 24-27, 2017
22. **Zea, L.**, Stodieck, L. and Klaus, D., Characterizing Phenotypic and Gene Expression Changes in *E. coli* Challenged with Antibiotics during Spaceflight, 4th International Space Station Research and Development Conference, Boston, MA, July 7-9, 2015
23. **Zea, L.**, Stodieck, L. and Klaus, D., Preliminary Results of the Antibiotic Effectiveness in Space-1 (AES-1) Experiment Conducted Onboard ISS, ASGSR Conference, Pasadena, CA, October 22-26, 2014
24. **Zea, L.**, Stodieck, L. and Klaus, D., The First Fifty Years of Bacterial Growth and Antibiotic Effectiveness Research in Space, ASGSR Conference, Pasadena, CA, October 22-26, 2014
25. **Zea, L.**, Stodieck, L., Klaus, D.M., Bacterial Growth and Susceptibility to Antibiotics in Simulated Reduced Levels of Gravity, ASGSR Conference, Orlando, FL November 3-8, 2013
26. Mitchell, R., **Zea, L.**, Over, S., Aber, I., Anderson, D., Carpenter, J., Curtis, B., Duchek, M., Edwards, W., Hava, H., Lestishen, J., Massina, C., Roth, B., Dream Chaser: Design of a Commercial Spacecraft's Cockpit, SpaceVision 2011, Boulder CO, October 27-30, 2011
27. **Zea, L.**, Jepson, P., Kumar, R., Role of Pressure and Reaction Time on Corrosion Control of H₂S Scavenger, SPE 2008 Oilfield Corrosion Conference, Scotland, UK, May 27-30, 2008

Technical Presentations, Seminars & Workshops

1. **Zea, L.** Thinking Outside the Globe - Using Microgravity to Find Novel Solutions to Medical Problems on Earth, Aerospace Engineering Sciences Faculty Candidate Seminar, April 30, 2018
2. **Zea, L.** What happens when bacteria grow in microgravity? The story of an experiment performed on the International Space Station, Valencia Community College – Osceola Campus, April 3, 2018
3. **Zea, L.** On Scientific and Technical Publishing, Universidad del Valle de Guatemala, May 3, 2018
4. **Zea, L.**, What happens when bacteria grow in microgravity? The story of an experiment performed onboard the International Space Station, The University of New South Wales School of Biotechnology and Biomolecular Sciences & Australian Centre for Astrobiology, Sydney, Australia, October 3, 2017
5. **Zea, L.**, Beneficios de Investigaciones Biomédicas en Órbita Terrestre, Convergencia, Guatemala, Guatemala, Julio 24-28 2017
6. **Zea, L.**, Diseño del Primer Satélite Guatemalteco, Convergencia, Guatemala, Guatemala, Julio 24-28 2017
7. **Zea, L.**, Past, Current and Future Space Applications in Latin America, Latin America and Caribbean Regional Seminar, Promoting disarmament and non-proliferation in Latin America and the Caribbean: relevance and challenges of the Hague Code of Conduct, Santiago de Chile, Chile, April 25, 2017
8. **Zea, L.**, Space Development Efforts in Guatemala, Americas Roundtable, 32nd Space Symposium, Colorado Springs, USA, April 11, 2016
9. **Zea, L.**, Bacterial Experiment returned from the International Space Station – Research Opportunity, BioFrontiers Science Shorts, University of Colorado, January 21, 2015
10. **Zea, L.**, Space Life Sciences and Antibiotic Effectiveness in Space, HudsonAlpha Seminar, HudsonAlpha, Huntsville, AL, Oct 30, 2014

11. **Zea, L.**, Space-Based Life Sciences Research and its Benefits to the General Public, Icelandic Academy of Sciences, University of Reykjavik, Iceland, August 11, 2014 (invited)
12. **Zea, L.**, Bacteria in space: Statistical facts of the first 50 years of research and an experiment currently being conducted onboard ISS, German Aerospace Center's (DLR) Institute of Aerospace Medicine Seminar, Cologne, Germany, July 22, 2014
13. **Zea, L.**, Characterization of Gravity's Influence on Mass Transport Phenomena and its Impact on *E. Coli's* Behavior and Susceptibility to Antibiotics, BioFrontiers Seminar, University of Colorado, Boulder, February 13, 2013
14. **Zea, L.**, Spaceflight Bacteria-related Phenomena and their Implications on Astronaut Health, Gravitational Biology Seminar, German Aerospace Center, Cologne, Germany, May 8, 2014
15. **Zea, L.**, Some of BioServe's Flown Payloads to Space – From Cells to Mice, Astrobiology Seminar, Institute of Aerospace Medicine, DLR, Cologne, Germany, May 28, 2014
16. **Zea, L.**, Student European Low Gravity Research Association, German Aerospace Center, Cologne, Germany, July 4, 2014

Magazines, Newspapers & Newsletters

1. **Zea, L.** Todo lo que debe saber sobre la Estación Espacial Internacional (EEI). Prensa Libre, Guatemala, April 21, 2018
2. **Zea, L.** ¡Despega un cohete de agua! Prensa Libre, Guatemala, Febrero 2018
3. **Zea, L.**, Why do Bacteria Behave Differently in Space?, European Low Gravity Research Association (ELGRA) 2017 Newsletter
4. **Zea, L.**, How Bacteria's Strange Behavior in Space Can Benefit Humanity, Astronauts4Hire Newsletter, Issue 6, Summer 2014

Current Projects

1. **PI**, Oct 2018-Sep 2020 "Characterization of Clinically- and Spaceflight-Relevant Bacteria and Fundi and Drug Effectiveness under Simulated Lunar, Martian, and Microgravity", NASA 80NSSC18K1468
2. **Co-I**, Jan 2018-Jun 2019 "Determining Muscle Strength in Space Flown *Caenorhabditis elegans* (Micro-16) - Mission Integration and Operations", NASA NNJ15GK01C (PI: Louis Stodieck, Ph.D.)
3. **PI**, Jan 2017-Dec 2020 "Characterization of Biofilm Formation, Growth and Gene Expression on Different Materials and Environmental Conditions in Microgravity", NASA, (80NSSC17K0036)
4. **Co-PI**, Jun 2017-May 2019 "Guatemalan CubeSat", United Nations Office of Outer Space Affairs (UNOOSA) and the Japanese Space Agency (JAXA), KiboCUBE Opportunity 2017, no exchange of funds, launch and deployment of satellite from ISS' Kibo Module
5. **Co-I**, Feb 2017-Dec 2018 "Integration of 'Space flight- Altered Motility Activation and Fertility- Dependent Responses in Sperm' (Micro-11)", NNJ17GU26T

Previous Projects

6. **Graduate Research Assistant**, Jan 2014-May 2015 (PI D. Klaus, Co-I L. Stodieck) Antibiotic Effectiveness in Space (AES-1), (CASIS, GA-2014-146)

Teaching Experience

- "Project Management & Systems Engineering for Space Projects" Universidade Federal de Minas Gerais, Brazil 2015
- "Hardware Design & Engineering Project Management", Universidad del Valle de Guatemala, 2013-2015
- "Microbiology" class of the "Space Life Sciences" course, University of Colorado, Boulder 2014

Graduate Students – M.S.

- Shilpi Ganguly, M.S., Modern Human Anatomy, Feb 2017 to May 2018. Thesis title: Characterization of *Pseudomonas Aeruginosa* Growth Patterns Under Varying Gravitational Regimes. Master of Science in Modern Human Anatomy, Anschutz Medical Campus, University of Colorado, Boulder, May 2018

- Rylee Schauer, M.S., Aerospace Engineering – Bioastronautics, May 2018 to date.

Undergraduate Students

- Philip Rubin, Senior, Micro, Cellular, and Developmental Biology (MCDB), July 2017 to date
- Zeena Nisar, Soph., MCDB, Feb 2017 to date
- 100+ undergraduate engineering students working at UVG in the CubeSat project (2014 to date)

Service

International

International Academy of Astronautics (IAA)

Member of the Biomedical Committee (2014 to date)

Member of the 2nd IAA Latin American CubeSat Workshop Scientific Committee (2015)

European Low Gravity Research Association (ELGRA)

Member (2014 to date)

Red Internacional de Científicos Guatemaltecos

Member (2017 to date)

National

American Society for Gravitational and Space Research (ASGSR)

Member (2013 to date)

Member of Journal Committee (2018 to date)

American Institute of Aeronautics & Astronautics (AIAA)

Member (2006 to date)

Cape Canaveral Chapter, Young Professionals Officer (2009-2010)

American Astronautical Society (AAS)

Member of the International Space Station Utilization Committee

Session Chair “Model Organisms”, ISS Research & Development Conference, San Diego, CA, July 7-9, 2016

Session Chair: “Biological Insights in Space”, ISS Research & Development Conference, Boston, MA, July 6-9, 2015

Delta Epsilon Iota, Academic Honor Society

Member (2008 to date)

Reviewer

ISS Research & Development Conference, Washington, D.C., July 17-20, 2017

ISS Research & Development Conference, San Diego, CA, July 7-9, 2016

ISS Research & Development Conference, Boston, MA, July 6-9, 2015

ISS Research & Development Conference, Chicago, IL, June 17-19, 2014

Campus

Adviser for the “Kinetic Energy Exchange by Magnetic Means Propulsion Experiment”, Space Florida 2nd Student Parabolic Flight Campaign (2007)

Vice-President, HGSA, Hispanic Graduate Student Association, UCF (2007-2008)

Advisory Board Member, UCF Graduate Student Association, School of Engineering Representative (2008)

Founding Member, University’s Concert Marimba (Guatemala’s National Instrument) (2004-2005)

Outreach

Given talks to

2017 300+ high school and college students in Guatemala

2016 30+ students and multiple organizations (e.g. Rotary Club)

2015 100+ students

2013 2,100+ students in 3 universities and 15 schools

2012 350+ students in 4 school

Engineering Judge

2015 Corden Pharma Science Fair

2013 Boulder Valley Science Fair

2007 Florida Science Olympiad

Professional Affiliations

- International Space Station Utilization Committee, American Astronautical Society
- ELGRA, European Low Gravity Research Association
- ASGSR, American Society for Gravitational and Space Research
- Delta Epsilon Iota, Academic Honor Society
- AIAA, American Institute of Aeronautics and Astronautics

Community Service

Red Cross Volunteer, Disaster Action Team, Mid-Florida Chapter (2006-2010), Mile High Chapter (2010-2014)

SWAP Volunteer, Student-Worker Alliance Program, taught English to other immigrants (2010-2011)

Additional Certifications

- Aerospace Standards for Small Satellites, AIAA Rocky Mountain Section Seminar, Colorado Springs, 2014
- Biosafety Training, Department of Environmental Health & Safety, University of Colorado at Boulder, 2017
- NASA CAPPs Life Sciences Laboratory Safety, Kennedy Space Center, 2011
- NASA CAPPs Life Sciences Laboratory Hazardous Waste Management, Kennedy Space Center, 2011
- NASA CAPPs Life Sciences Laboratory Biohazardous Waste Management, Kennedy Space Center, 2011
- Micro-Gravity Experiment Integration Workshop. Hawking Center for Microgravity Education and Research Center. Space Florida Flight. Kennedy Space Center, 2007
- Computer Languages: Basic, Pascal, C++
- Other software: STK, InDesign, Photoshop, Microsoft Word, Excel and PowerPoint
- Proficient in SolidWorks, ProE, AutoCad, ANSYS
- Zentrale Mittelstufe (German test equivalent to TOEFL); Zertifikat (German Proficiency Test)
- Workshops: CAD-CAM, 2005; Metal Machining, 2004; CAD, 2003; Welding, 2003
- Certified SCUBA diver, SDI, [2008]
- Certified Life Guard, Mid Florida Red Cross, October [2009]