



EDL Summer Seminar Series- STMD Early Career Initiative

Sarah D'Souza

NASA Ames Research Center

TJ Wignall, Steven Snyder, Som Dutta

NASA Langley Research Center

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Agenda

- *NASA – How did we get here?*
- *ECI Programmatic*
- *ECI Technical*
 - Future: HiMOM and Aerocapture*
 - Present: AeroFusion*
 - Past: Pterodactyl*
- *Q&A Session*



Our Path to NASA

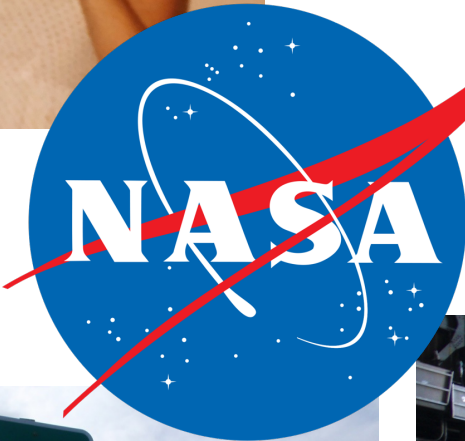
Sarah D'Souza, Ph.D.



University of California at Davis Graduate
Mechanical and Aerospace Engineering

Dissertation: Improving Entry Vehicle Shape
Optimization via a Guidance Algorithm for
Trajectory Generation

*** **NASA Pathways Program:** ISS Water
Recovery Systems, Space Shuttle Mechanical
and Robotics Systems Training, Ice Sensing &
Electromagnetics Systems, and Orion Flight
Dynamics and Trajectory Design



Officially joined NASA
Ames Research Center as
a Civil Servant in 2013!

Organization: Code TSS - Entry Systems and Vehicle
Development Branch



Primary Expertise:

- Guidance, Navigation, and Control for Entry Spacecraft
- Flight Simulations for Aerospace Vehicles

NASA Career Path:



Low Altitude Flight Systems



High Altitude Flight Systems



Spaceflight, Entry Systems



Spaceflight, In-Space Systems

T.J. Wignall

Education:

- BS/MS at Old Dominion University
 - Mechanical Engineering/Aerospace Engineering
- PhD in Aerospace Engineering at North Carolina State University (in progress)

Select Internships and Research Projects:

- 3 LARSS Internships – NASA LaRC
 - Computational Fluid Dynamics Focused
- Next Gen Air Traffic Control – ODU/NASA LaRC
- CFD for Space Launch System – NASA LaRC
- AeroFusion – NASA LaRC

Steven Snyder

Education:

- BS/MS in Mechanical Engineering from Rochester Institute of Technology
- PhD in Mechanical Engineering from University of Illinois at Urbana-Champaign
 - Adaptive Control Theory

Select Internships and Research Projects:

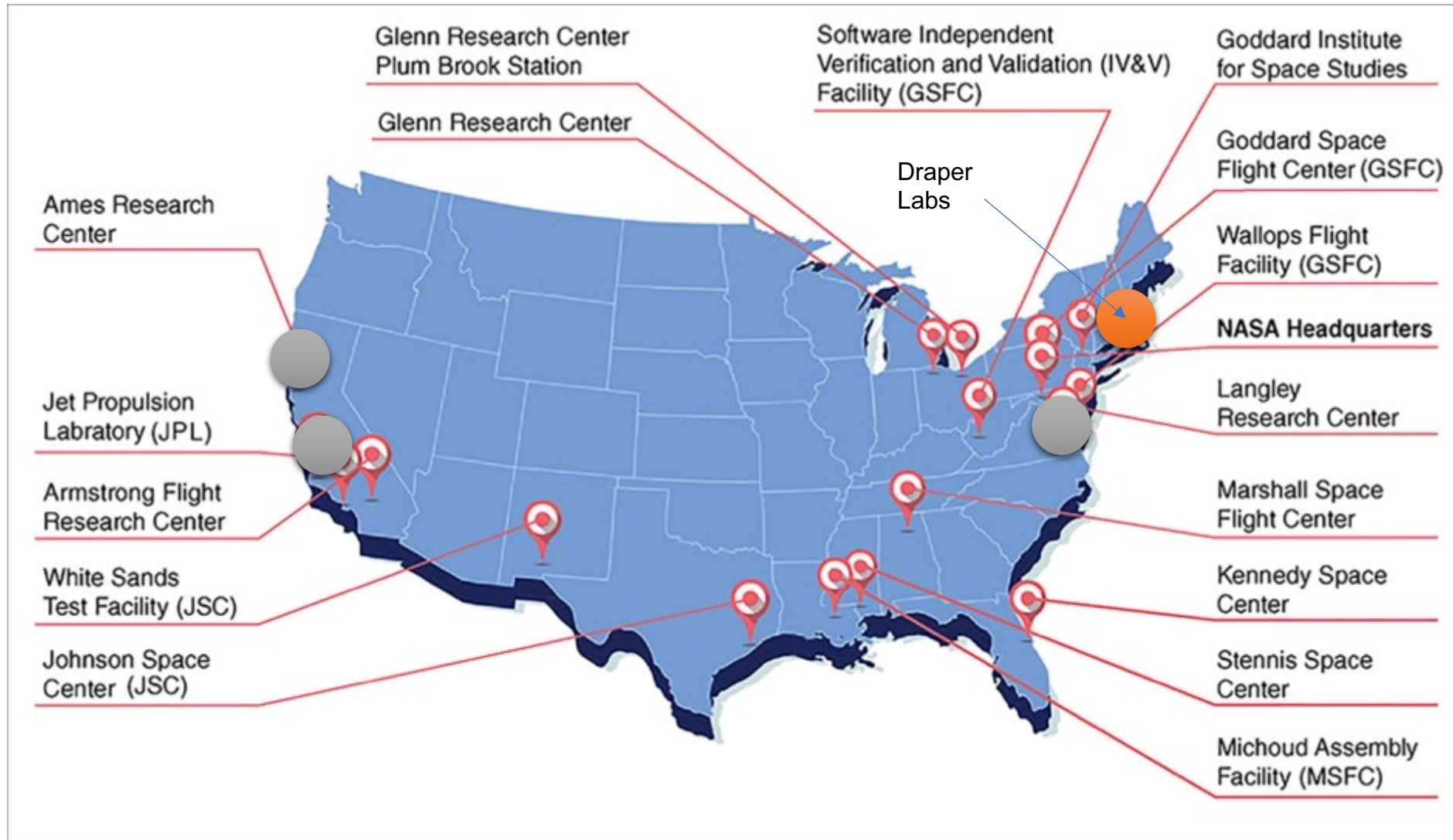
- GPS III program – Lockheed Martin Space Systems Co.
- Magnetically levitated left ventricular assist device – RIT
- Solid oxide fuel cell – ultracapacitor hybrid energy system – RIT
- Learn-to-Fly – UIUC/NASA LaRC
- AeroFusion – NASA LaRC

Path to NASA – Inspiration

Sojourner First Images (1997)



Path to NASA – Tour NASA





STMD's Early Career Initiative

2022 NASA ECI: Overview

NASA Early Career Initiative

- Annual internal NASA proposal call focused on early career personnel development that advances Space Technology Mission Directorate (STMD) technology and closes gaps
- Typically, 2-year effort, \$2.5M budget
- Non-NASA partners required. Partner organization costs are factored into the total ECI budget, commensurate with the proposed partner roles. Cost sharing with external partners is encouraged but is not required.
- Proposal requires addressing NASA gaps/challenges, innovation, budget, scheduling, understanding risk, majority civil servant team, and development of a 3 minute video



ECI EDL Innovation – Past, Present, Future



Questions