



# SSEP

## Student Spaceflight Experiments Program



### SSEP Mission 13 to ISS: *Gemini* Experiments Payload Summary

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#### 41 Experiments Comprising the SSEP Mission 13 to ISS *Gemini* Payload

|   | Community                          | Experiment  | Team   | Grades | At Launch |
|---|------------------------------------|---|--|--------|-----------|
| 1 | Sao Paulo, BRAZIL                  | Capillarity versus Gravity in the Filtration Process  | 4 Co-Principal Investigators                                     | 11     |           |
| 2 | Edmonton, Alberta, CANADA          | The Effect of Microgravity on the Germination of <i>Nasturtium Officinale</i> (Watercress)  | 2 Co-Principal Investigators, 2 Co-Investigators, 1 Collaborator | 9      |           |
| 3 | Qualicum, British Columbia, CANADA | Investigating the Growth Patterns of Alfalfa ( <i>Medicago sativa</i> ) Sprouts in Microgravity: a Potential Nourishment for Future Manned Spaceflights | 5 Co-Principal Investigators                                     | 11-12  | X         |
| 4 | Winfield, AL                       | Purification of Water in Microgravity   | 5 Co-Principal Investigators                                     | 12     |           |
| 5 | Corcoran, CA                       | The Brine Shrimp Study  | 2 Co-Principal Investigators, 2 Co-Investigators, 1 Collaborator | 7      |           |
| 6 | La Verne, CA                       | <i>Flammulina velutipes</i> Growth in Microgravity  | 4 Co-Principal Investigators                                     | 11-12  | X         |
| 7 | Moreno Valley, CA                  | The Growth and Development of Sustainable Brine Shrimp in Microgravity  | 1 Principal Investigator, 2 Co-Investigators, 2 Collaborators    | 7      |           |
| 8 | North Hollywood, CA                | The Effects of Microgravity on Cell Recognition   | 2 Co-Principal Investigators                                     | 10-11  | X         |

|    |                                   |   |  |         |   |
|----|-----------------------------------|---|--|---------|---|
| 9  | Riverside, CA                     | The Effects of Microgravity on Saturated Copper Sulfate Crystals                          | 2 Co-Principal Investigators, 1 Co-Investigator<br>3 Collaborators | 4-5     | X |
| 10 | Riverside, CA                     | Effects of Microgravity on Radish Seed Germination  | 2 Co-Principal Investigators                                       | 7       |   |
| 11 | Riverside, CA                     | <i>Chenopodium quinoa</i> Cell Development in Microgravity                                | 5 Co-Principal Investigators                                       | 11-12   |   |
| 12 | Ashford/Willington, CT            | How Microgravity Effects Beetroot Seed Germination  | 4 Co-Principal Investigators, 2 Co-Investigators                   | 6 and 8 |   |
| 13 | Hillsborough County, FL           | Mung Bean Project 2018  | 4 Co-Principal Investigators                                       | 6-7     | X |
| 14 | Port St. Lucie, FL                | The Effects of Microgravity on the Germination of Culinary Lavender                       | 2 Co-Principal Investigators,<br>2 Co-Investigators                | 8       |   |
| 15 | Berea, KY                         | Rate of Rust Formation in Microgravity  | 1 Principal Investigator, 3 Co-Investigators, 2 Collaborators      | 11      | X |
| 16 | Anne Arundel County, MD           | Effect of Microgravity on the Structural Strength of Concrete                             | 4 Co-Principal Investigators                                       | 6       |   |
| 17 | Montgomery County, MD             | Mixing Cement with Steel Shavings   | 5 Co-Principal Investigators                                       | 7       |   |
| 18 | University System of Maryland, MD | Biofilm Adhesion of <i>E. coli</i> to Annealed Porous and Smooth Aluminum in Microgravity | 5 Co-Principal Investigators                                       | 13      |   |
| 19 | Fitchburg, MA                     | How is the Growth of the Bacteria <i>Frankia alni</i> Affected by Microgravity?           | 2 Co-Principal Investigators, 3 Co-Investigators                   | 10      |   |
| 20 | Redford, MI                       | Can Peppermint Seeds Germinate in Space?  | 5 Co-Principal Investigators, 2 Co-Investigators                   | 8       |   |
| 21 | Traverse City, MI                 | The Growth of <i>Bacillus Subtilis</i> on a Substrata Material in Microgravity            | 2 Co-Principal Investigators                                       | 7       | X |
| 22 | Kansas City, MO/KS                | The Growth of Mint in Microgravity  | 4 Co-Principal Investigators                                       | 7-8     | X |
| 23 | Clark County, NV                  | Will Quinoa Grow in Microgravity?   | 5 Co-Principal Investigators                                       | 5       | X |

|    |   |  |   |       |   |
|----|---|--|---|-------|---|
| 24 | Galloway, NJ – Stockton University        | Analysis of Double-stranded Break Repair in Haploid <i>Saccharomyces cerevisiae</i> Under Spaceflight Conditions | 3 Co-Principal Investigators                                      | 13-16 | X |
| 25 | Ocean City, NJ                            | The Effect of Microgravity on the Hatch Rate and Development of <i>Artemia salina</i>                            | 2 Co-Principal Investigators, 2 Collaborators                     | 10-11 | X |
| 26 | Springfield, NJ                           | <i>Triops longicaudatus</i> Growth and Development in Microgravity   | 4 Co-Principal Investigators,                                     | 7     |   |
| 27 | Jefferson County, NY                      | Rust Investigation   | 5 Co-Principal Investigators                                      | 6     | X |
| 28 | Suffolk County, NY                        | Effect of Microgravity on Effectiveness of Probiotics  | 5 Co-Principal Investigators                                      | 5     |   |
| 29 | WNY STEM – Buffalo/Niagara, NY            | The Effect of Microgravity on <i>Bacillus subtilis</i> on Subsequent Terrestrial Behavior                        | 4 Co-Principal Investigators                                      | 7-9   | X |
| 30 | Hunter, ND                                | Kefir Water  | 2 Co-Principal Investigators                                      | 6     | X |
| 31 | Hershey, PA – Milton Hershey School       | Effects of Microgravity on the Growth of Algae Cysts and Lipid Production  | 2 Co-Principal Investigators                                      | 9-10  | X |
| 32 | Hershey, PA – Milton Hershey School       | The Effect of Microgravity on the Adhesion and Curing of Oil-based Artist Paint                                  | 3 Co-Principal Investigators                                      | 12    | X |
| 33 | Pittsburgh, PA – University of Pittsburgh | Transcriptomic Analysis of <i>Escherichia coli</i> Response to Ciprofloxacin in Microgravity                     | 3 Co-Principal Investigators                                      | 16    | X |
| 34 | Knox County, TN                           | How to Produce a Synthetic Soil from Waste Generated Onboard ISS   | 2 Co-Principal Investigators, 2 Co-Investigators, 2 Collaborators | 10-11 | X |
| 35 | Burleson, TX                              | The Effects of Microgravity on the Growth of Red Wiggler Earthworms  | 5 Co-Principal Investigators                                      | 6     |   |
| 36 | Ector County, TX                          | A Novel Way to Treat Cancer with <i>C. sporogenes</i> in Microgravity  | 2 Co-Principal Investigators, 4 Co-Investigators                  | 6     |   |
| 37 | Klein, TX                                 | The Effect of Self-Assembled Monolayers on Microgravity Protein Crystallization                                  | 3 Co-Principal Investigators                                      | 11-12 | X |

|    |                         |  |  |       |   |
|----|-------------------------|--|--|-------|---|
| 38 | Marfa, TX               | Eradicating Bacteria Growth in Microgravity  | 2 Co-Principal Investigators, 4 Co-Investigators             | 4-6   | X |
| 39 | Pharr, TX               | What are the Effects of Microgravity on the Cellular Growth of <i>Spinacia oleracea</i> ?          | 1 Principal Investigator, 2 Co-Investigators, 1 Collaborator | 11    | X |
| 40 | Raleigh County, WV      | Effects of Microgravity on the Growth of <i>Caulobacter Crescentus</i>                             | Not Available  | 11-12 |   |
| 41 | iForward-Grantsburg, WI | What Happens to the Germination of <i>Solanum lycopersicum</i> 'Red Velvet' Seeds in Microgravity? | 4 Co-Principal Investigators                                 | 9-11  | X |

The Student Spaceflight Experiments Program (SSEP) is a program of the National Center for Earth and Space Science Education (NCSSE) in the U.S. and the Arthur C. Clarke Institute for Space Education internationally. It is enabled through a strategic partnership with DreamUp, PBC and NanoRacks, LLC, which are working with NASA under a Space Act Agreement as part of the utilization of the International Space Station as a National Laboratory. SSEP is the first pre- college STEM education program that is both a U.S. national initiative and implemented as an on-orbit commercial space venture.