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in /in/rodrigo-schmitt

## MOTIVATION

A major driver in the coming two decades will be the return of human explorers to the Moon. Furthermore, the challenges involved in long-distance human exploratory missions such as Mars are surely one of the most ambitious human endeavors ever taken.

I chose to play an active role in the transformation of humanity to a multi-planetary species because I don't want to watch it from afar. Instead, I want to make it happen.

## SKILLS

### Software

Python	<div style="width: 100%;"></div>
Microsoft Office	<div style="width: 100%;"></div>
LaTeX	<div style="width: 100%;"></div>
MATLAB	<div style="width: 100%;"></div>
C	<div style="width: 100%;"></div>
Fortran	<div style="width: 100%;"></div>
Fusion 360	<div style="width: 100%;"></div>
HTML, JS, CSS	<div style="width: 100%;"></div>
LINUX	<div style="width: 100%;"></div>
SQL	<div style="width: 100%;"></div>
Flutter	<div style="width: 100%;"></div>
ANSYS	<div style="width: 100%;"></div>
Simulink	<div style="width: 100%;"></div>

### Languages

Portuguese	<div style="width: 100%;"></div>
English	<div style="width: 100%;"></div>
Spanish	<div style="width: 100%;"></div>
Japanese	<div style="width: 100%;"></div>

## ADDITIONAL EDUCATION

### Winter School - Introduction to Space Technologies (INPE)

3-week-long, 100h (07/19)  
All satellite development stages.

### Spacecraft Dynamics & Control Specialization

CU Boulder on Coursera (11/20)  
Credential ID: UWR9V3ZPS295

### Deep Learning Specialization

DeepLearning.AI on Coursera (02/21)  
Credential ID: 9PBV369FZ2DV

# RODRIGO SCHMITT

## EDUCATION

### Bachelors of Science in Astronomy

University of São Paulo, Brazil | 02/15 - 08/19  
#1 in class.

### Bachelors of Science in Physics

University of São Paulo, Brazil | 08/19 - 12/19  
Double degree in one extra semester.

### Exchange Program

University of Notre Dame du lac, USA | 01/18 - 05/18  
Final GPA: 3.8/4.0.

### Master of Science in Space Engineering & Technology

National Institute for Space Research, Brazil | 02/21 - 02/22

Major Area: Space Mechanics & Control. Finished in 1 year instead of regular 2.

### PhD in Aeronautics & Astronautics

Purdue University, USA | 06/21 - Present

Major Area: Systems Engineering. Minor area: Propulsion.

## RESEARCH

### CubeSat Development for Scientific Disclosure

Dr. Jane Hetem - University of São Paulo | 02/17 - 06/17

Printed Circuit Board electronics, Arduino programming in C and lab work.

### Orbit Determination Programming

Dr. Helio Kuga - National Institute for Space Research | 07/17 - 12/17

Studied astrodynamics and developed Fortran codes for orbit determination.

### Mineralogical Analysis of an Apollo 16 Lunar Basalt

Dr. Clive Neal - University of Notre Dame du lac | 01/18 - 06/18

Lab work using electron microprobe.

Statistical analysis of element compositions.

### Swing-By & Radiation Prediction in Low Thrust Transfer Orbits

Dr. Antonio Prado - National Institute for Space Research | 07/18 - 02/22

Investigated a spacecraft's radiation exposure during a mission to the Moon.

Developed a 3D model for the distribution of particles in the Van Allen Belts.

Created a Neural Network regression relating initial conditions to predictions.

### Cislunar Space Refueling System-of-Systems

Dr. Daniel Delaurentis - System-of-Systems Lab, Purdue University | 02/22 - Present

Mission architecture of space systems involved in cislunar space exploration.

Novel Python Object-Oriented Programming Framework.

## ORGANIZATIONS

### International Recruitment Advisor, also Marketing Manager of Outgoing Volunteering Programs

AISEEC, University of São Paulo | 10/15 - 12/16

- Volunteer in a team of 5. Assisted 20 international students to multinationals.

- Volunteer in a team of 6. Data analysis; Sales; CX; buyer personas. Excel & PPT.

## ACHIEVEMENTS

### Poli/USP Scholarship - 2017

#### Spaceport America Cup

12 students selected from Project Jupiter's 55 members.

### 2017 AUCANI International Mobility Scholarship

1 student selected out of 59k. Process #690/2017.

### PRCEU Scientific Disclosure Fellowship (03/17 - 06/17)

Category #1938.

### CNPq Fellowship - Research (07/18 - 10/18)

Grant #2018/14757-0.

### FAPESP Fellowship - Research (11/18 - 12/19)

Grant #2018/16442-6.

### FAPESP MSc Fellowship - Research (04/21 - 03/22)

Grant #2020/13557-7.

### 2021 Ross Fellowship

Given to best graduate applicants to Purdue.

### 2022 Purdue Engineering Graduate Showcase

Honorable Mention - Grad Students & Postdocs

### 2017 Spaceport America Cup

4th place out of 9 in the "10k ft SRAD Solid" category.

### 2017 Brazilian Rocket Competition

Overall winner out of 25.

### 2018 NASA Student Launch

10th place out of 45. Education Engagement.

### 2019 Latin America Space Challenge (LASC)

2nd place out of 26.

### 2020 LASC

Overall winner out of 26.

*We are what we repeatedly do. Excellence, then, is not an act, but a habit.*

Will Durant

### **Aerodynamics & Structures Member, also Marketing Director**

*Project Jupiter - Rocket Design Team, University of São Paulo | 07/16 - 06/17*

- Optimal sizing of parts through merit function analysis. Vacuum infusion manufacturing of carbon-fiber structure. Imperius: rocket launched to 10k ft. - Leader of a team of 4, recruitment process lead, outreach to magazines.

### **Structures Member**

*Notre Dame Rocket Team, University of Notre Dame du lac | 01/18 - 05/18*

Model, laser cut, and 3D print of parts. Murphy: rocket launched to 5,280 ft.

### **Structures Coordinator**

*Project Jupiter - Rocket Design Team, University of São Paulo | 08/18 - 07/19*

Leader of 5. CAD (Fusion 360), Structural Analysis (ANSYS), Manufacturing of CFRP. Caldene: rocket launched to 3k ft. Callisto: rocket launched to 10k ft.

### **Programming Teacher, also Data Scientist & Machine Learning Specialist**

*Let's Code Academy, Brazil | 02/20 - 02/21*

Python Pro (48h): Language fundamentals, OOP, webscraping, APIs.

Python for Finance (24h): Data Science, Machine Learning and Time Series.

Data Science & Artificial Intelligence (72h): Data analysis, classification, clustering, regression, Neural Networks, CNNs, NLP.

Built a Reinforcement Learning recommendation AI for the company's learning management system.

### **Co-founder & Front-end Project Manager**

*RocketPy, Brazil | 06/21 - Present*

Next-level rocketry Python library (see [github.com/Projeto-Jupiter/RocketPy](https://github.com/Projeto-Jupiter/RocketPy)).

High-fidelity variable mass six degree-of-freedom dynamic model.

Leader of a team of 5. Development of a UI in Flutter.

### **Founder & President**

*Space & Earth Analogs Research Chapter, Purdue | 02/22 - Present*

Leader of a team of 30+. Organized events, space analog missions (Mars Desert Research Station) and space exploration competitions (NASA RASC-AI).

## PUBLICATIONS

### **OPTIMIZATION OF LOW THRUST TRANSFER ORBITS OF A SPACECRAFT CONSIDERING THE RADIATION HAZARD FROM THE VAN ALLEN BELTS**

AIAA/AAS 2019 Astrodynamics Specialist Conference.

Volume 171 of the Advances in the Astronautical Sciences Series.

*Schmitt R. N., Sukhanov A. S., Barbosa G. & Prado A. F. A. B. | 2019*

### **ROCKETPY: A SIX DEGREE-OF-FREEDOM LAUNCH VEHICLE TRAJECTORY SIMULATOR**

Journal of Aerospace Engineering

DOI: 10.1061/(ASCE)AS.1943-5525.0001331

*Ceotto G. H., Schmitt R. N., Alves G. F., Pezante L. A. & Carmo B. | 2021*

### **SWING-BY APPLICATIONS AND ESTIMATION OF THE VAN ALLEN BELTS' RADIATION EXPOSURE FOR A SPACECRAFT IN A LOW THRUST TRANSFER TO THE MOON**

Journal of Symmetry - Special Issue Advances in Mechanics and Control

<https://doi.org/10.3390/sym14030617>

*Schmitt R. N., Prado A. F. A. B., Sukhanov A., Gomes V. M. | 2022*

### **ONEMARS: REQUIREMENTS FOR A ARTIFICIAL GRAVITY IN A SPACECRAFT FOR TRANSPORTATION OF A CREW TO MARS**

IEEE Journal of Radio Frequency Identification. doi:

10.1109/JRFID.2022.3162098.

*Schmitt R. N., Bertaglia A. B., Rosa G. J., Moscati, N. R., Moreira, D. F. M., Loureiro G. | 2022*