Patrick S. Wang

☏ (760) 249 4262 • ✉ patrick.s.wang@jpl.nasa.gov

EDUCATION

University of Stuttgart 07.2007 – 12.2013
Bachelor's and Master's degree in Aerospace Engineering Stuttgart, Germany

California Institute of Technology 11.2012 – 07.2013
Graduate Resarcher at the Graduate Aerospace Laboratories Pasadena, USA
Thesis in "Experimental Analysis of Supersonic Flow on a Concave Surface"

Rensselaer Polytechnic Institute 08.2011 – 05.2012
Exchange student in the GE4 Exchange Program for Engineers Troy, USA
Member of the Rensselaer Formula Hybrid Racing Team
First place in the Rensselaer Business Plan Competition

WORK EXPERIENCE

NASA Jet Propulsion Laboratory Since 02.2016
Technologist in Laboratories Studies and Atmospheric Observation Wrightwood, CA

- Optimization and operation of Lidar instruments at Table Mountain Facility (TMF) and Mauna Loa Observaory (MLO)
- Maintennce and optimization of the TMF balloon instrumentation
- TMF Cryogenic Frost-Point Hygrometer sonde preparation, calibration and launch
- TMF and MLO microwave radiometers calibration

Mercedes Benz Technology Center 01.2015 – 02.2016
Mechanical Engineer in the department of Powertrain Ulm, Germany

- Designed, constructed and verified testing platforms for high-speed laser optics
- Developed software for the analysis of high speed images in internal combustion engines
- Developed software to study harmonic disturbances in rotation-"ring/liner"-tribometer

NASA Jet Propulsion Laboratory 06.2014 – 10.2014
Graduate Fellow in the Mars Program Formulation Office Pasadena, USA

- Modeled and optimized multi-launch mission architecture for Mars sample return
- Simulated shock environment for mobile Mars Ascent Vehicle survivability study
- Designed mission architecture of robotic sample return from lunar distant retrograde orbits
- Simulated Martian dust propagation for planetary protection objectives

Institute of Space Systems at the University of Stuttgart 10.2011 – 08.2012
Research Assistant in the Deparment of Astronautics Stuttgart, Germany

- Modeled and simulated life support systems with fuel cells for manned missions to Mars
- Designed an effective linear stage system for image acquisition for ESA's Zero-G experiment
- Examined the effects of the gas composition on fuel cells with a white-light interferometer

TWT Consulting GmbH 10.2009 – 03.2010

Intern in the department of Automotive Engineering Neuhausen, Germany

- Constructed FE-Models of automotive and aircraft components for heat flux calculations
- Conducted CFD-simulations on automobiles with OpenFOAM and StarCCM+

THESES

Graduate Aerospace Laboratories at Caltech 11.2012 – 09.2013

Visualized a supersonic boundary layer with a novel laser schlieren system in a supersonic wind tunnel. Designed, built and tested an IR experiment for quantitative heat flux measurements. Developed software to acquire flow charateristics from images. The objective is to investigate the formation of supersonic Goertler vortices and post-process schlieren images for flow transition analysis and heat flux estimations.

Institute of Thermodynamics at the University of Stuttgart 05.2012 – 11.2012

Evaluated the thermal conductivity of ceramics used as protection on turbine blades. Heat transfers through porous materials were modeled. The goal is to explore the thermodynamic traits that lead to a higher turbine exit temperature and increase efficiency of the gas turbine.

WORKSHOPS AND ORGANIZATIONS

Caltech Space Challenge 2013 03.2013

- Mentored students in life support technology and systems engineering

Caltech Space Challenge 2011 09.2011

- Selected scientific instruments to conduct research in the proximity of the asteroid
- Designed a fuel cell integrated life support system for missions to near-Earth asteroids

Space Station Design Workshop 2010 07.2010

- Designed various methods for sample retrieval for manned missions to near-Earth asteroids

ADDITIONAL SKILLS

Programming languages: Fortran, Python, HTML/ CSS

Programs: Abaqus, Matlab, Medina, OpenFOAM, Solidworks, StarCCM+, STK

Languages: English (fluent), German (fluent), Mandarin Chinese (advanced)

PUBLICATIONS

P. S. Wang, M. Ono and R. E. Lock,
"Reliability Analysis of Multi-Launch Sample Return Missions using the Space Mission Architecture and Risk Analysis Tool (SMART)", 66th International Astronautical Congress 2015, Jerusalem, Isreal

N. J. Parziale, B. E. Schmidt, P. S. Wang, H. G. Hornung and J. E. Shepherd,
"Pulsed Laser Diode for use as a Light Source for Short-Exposure, High-Frame-Rate Flow Visualization", 53rd AIAA Aerospace Science Meeting 2015, Kissimmee, Florida