



**Holly Larson Capelo**

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## EDUCATION

**Georg-August Universität Göttingen**, Göttingen, Germany 16.10.2017 (*Viva Voce*)/29.05.2018  
International Max Planck Research School (IMPRS) for Physics of Biological and Complex Systems (PBCS)

Ph.D. Physics

Thesis title: *Dynamics of Suspended Dust Grains: Experimental Investigations and Implications for Protoplanetary Discs*

Advisor: Prof. Dr. Dr. h.c. Eberhard Bodenschatz

**Wesleyan University**, Middletown, CT, USA 27.05.2012

M.A. Astronomy

Thesis title: *The Trailing Edge of the KH 15D Circumbinary Ring*

Advisor: Prof. Dr. William Herbst

**Columbia University**, New York, NY, USA 11.02.2009

B.Sc. Astronomy

B.A. Literature and Writing

Thesis title: *Seeking X-ray Counterparts to Emission-line Sources in the Galactic Plane*

Advisor: Prof. Dr. Michael Shara

## ACADEMIC AND RESEARCH EXPERIENCE

**Physics Institute, University of Bern** since 06.2018  
*Postdoctoral Research; Project Manager, Senior Scientist* Bern, Switzerland

- Project leader of the TEMPus VoLA microgravity research program investigating dust–gas interactions relevant to planetesimal formation and regolith processes.
- Led development of experimental hardware and optical diagnostics supporting Solar System exploration and space-mission-relevant research.
- Supervision and mentoring of PhD and MSc students, as well as laboratory and technical staff.
- Active contributor to international collaborations in cometary and granular physics.

**Max-Planck-Institut für Dynamik und Selbstorganisation** 08.2012–10.2017  
*Doctoral Research* Göttingen, Germany

- Designed and executed laboratory experiments testing fundamental mechanisms of dust–gas instabilities relevant to early planet formation.
- Coordinated experimental infrastructure, instrumentation development, and interdisciplinary collaboration across physics and astrophysics groups.

**Yale University Department of Astronomy** 01.2009–07.2010  
*Queue Manager* New Haven, CT, USA

- Managed observing schedules and data flow for the SMARTS 1.3 m telescope.
- Liaison between international observing teams and technical staff.

**American Museum of Natural History**

06.2008-07.2008

*Research Assistant**Rose Center for Earth and Space, NY, NY, USA*

- Cross-referenced astronomical databases with proprietary ground-based observational survey of Galactic center, conducted under United States National Science Foundation grant ‘Research Experiences for Undergraduates’

**Center for International Earth Science Information Network**

03.2007-06.2007

*Research Assistant**Lamont-Doherty Earth Observatory, Palisades, NY, USA*

- Generated spatially resolved (ArcGIS) maps of animal species populations from NASA Earth Science Data

**ACADEMIC SERVICE****Consultant**

European Space Agency facility definition teams:

- Mars Exploration Science Orbiter Dust Analyser,
- ASTERIA (Active Sensors For Telemetry of Extraterrestrial Impactors at Gateway),

**Peer Reviewer**

- Monthly Notices of the Royal Astronomical Society (MNRAS),
- Astronomy & Astrophysics (A&A),
- The Astrophysical Journal (ApJ),
- Review of Scientific Instruments (RSI),
- Icarus,
- European Science Foundation (ESF) panels

**PhD committee member**

Stefano Pollastri student of Prof. Dr. Costanza Bonadonna, Département des sciences de la Terre, Université de Genève

**Thesis advisor**

- Thomas Planchet MSc
- Stefano Spadaccia PhD

**Co-editor in chief**

Exoplanet news (2018-2023)

**TEACHING****Guest Lecturer**, University of Bern, Switzerland

2024-2025

PHYS483670 : Exoplanets and the Origins of Life: Exoplanet formation and interiors

**Laboratory Instructor**, University of Bern, Switzerland

2019-2024

PHYS532776 Nuclear Magnetic Resonance, impact cratering, light scattering (Fall Semesters)

**Teaching Assistant**, Georg-August-Universität, Göttingen, Germany

2012

PHYS532776 Complex and Non-linear Dynamics in Physics and Biology (Fall semester)

**Teaching Assistant**, Wesleyan University, Middletown, CT, USA

2010–2012

ASTR155 Introduction to Astronomy (multiple iterations, included practical lab)

ASTR105 Stars and Stellar Systems (included night-time telescope observing)

**Teaching Fellow**, Yale University, New Haven, CT, USA

2009–2010

ASTR140 Frontiers and Controversies in Astrophysics (Spring Semester)

ASTR135 Archaeoastronomy (Fall Semester)

**Standardized Test Preparation**, CT, USA (various locations)

2009–2011

Delivered workshops and private tutoring for high school, college and graduate school entry exams (GRE, SAT, SSAT and PSAT)

**Astronomy Instructor**, Stanford University, Palo Alto, CA, USA

26.06.2006-04.08.2006

Students ages 11-15 yrs., Sally Ride Science Foundation Summer Camp

Six consecutive weeks, provided five hours daily instruction to female students ages 11–15

## FUNDING AND AWARDED PROPOSALS

- 2025-2026 Principal Investigator of early technology development project 'High Speed Imaging of Micrometeorites and Debris'; European Space Agency Open Space Innovation Platform.
- 2023-2025 SNSF grant number 207359. Studies of impact processes on small bodies: implications for asteroid formation and upcoming space missions
- 2021 Accepted PRODEX proposal in support of ESA-CORA project
- 2021 Selected ESA-CORA scientific proposal, designated for 78th ESA Parabolic flight campaign
- 2021 Selected experiment for 75 ESA Parabolic flight campaign
- 2019 Principal Investigator of microgravity research program TEMPus VoLA: The Timed Epstein Multi-pressure Vessel at Low Accelerations; supported as "New Initiative" by the Swiss National Centre for Competence in Research (NCCR) PlanetS
- 2019–2021 Swiss National Science Foundation flexibility grant; contribution for childcare expenses incurred due to work-related obligations, funding for laboratory assistances
- 2017 Travel grant from the IMPRS PBCS for the conference: *Planet Formation and Evolution 2017*
- 2013 Travel grant from the IMPRS PBCS for the program: *University of California High-Performance Astrocomputing Centre International Summer School on AstroComputing*
- 2013 Accepted NAO Proposal ID #2013A-0216: *Planet Formation in the KH 15D Circumbinary Ring*, W. Herbst, C. Hamilton, H. L. Capelo et al.
- 2009–2010 Teaching Fellowship, Yale University, Department of Astronomy, New Haven, CT, USA
- 2007 United States National Science Foundation grant Research Experiences for Undergraduates (REU), conducted at the American Museum of Natural History, Division of Physical Sciences, New York, NY, USA.
- 2006–2008 Hettena Scholarship for outstanding student in the physical sciences, School of General Studies, Columbia University. Equivalent to sixty percent tuition fees for a single semester, disbursed annually.

## INVITED TALKS AND SELECTED CONFERENCE PRESENTATIONS

- 2025 Pebbles in Planet Formation Workshop, RIKEN iTHEMS, Japan  
*Experimental Insights into Dust-Gas Interactions and Instabilities in Protoplanetary Discs*
- 2024 European Planetary Science Congress (EPSC), Berlin, Germany  
*Aerodynamic and Mechanical Properties of Dust Aggregates in Low-Gravity Environments*
- 2024 International Astronautical Congress (IAC), Milan, Italy  
*Swiss Flagship missions overview on behalf of NCCR PlanetS*
- 2023 Seminar speaker IPAG/IRAM, Grenoble, France  
*Exploring Cosmic Dust Dynamics in Weightlessness*
- 2021 Planetesimal Formation Meeting, Lund Observatory  
*Testing prescriptions for dust-drag flow instabilities with laboratory experiments*
- 2020 Seminar Speaker, Institute for Earth and Space Exploration, Western University, Canada  
*Direct measurements of dust-drag fluid instabilities*
- 2019 Ringberg Workshop: Turbulence and Structure Formation in Protoplanetary Discs, Germany  
*On aerodynamic instability in the flow of a particle stream in a dilute gas*
- 2019 International Symposium: From Pattern Formation to Turbulence, Kloster Banz, Germany  
*Dust, wind and ice: low-pressure laboratory flow processes for planetary science*
- 2019 NCCR PlanetS Workshop: Dust, Pebbles, and Minor Bodies, University of Bern  
*Experiments with dust and pebble analogues*
- 2019 Planetary Environments in the Laboratory, University of Stirling, UK  
*Low-pressure laboratory flow processes on protoplanetary dust analogues*
- 2018 Institute for Computational Science, University of Zurich (invited)  
*Observation of aerodynamic instability in the flow of a particle stream in a dilute gas*
- 2018 Département des sciences de la Terre, Université de Genève (invited)  
*Spontaneous concentration of dust-particle analogues via fluid instability*
- 2017 Planet Formation and Evolution Conference, Friedrich-Schiller-Universität Jena, Germany  
*Dust-drag induced fluid instability: experimental investigations*
- 2015 Centre for Star and Planet Formation, Statens Naturhistoriske Museum, Copenhagen, Denmark  
*A laboratory approach to drag-induced fluid instabilities in dusty protoplanetary disks*
- 2014 Planet Formation and Evolution Conference, Kiel University, Germany  
*Gas-particle interaction and planetesimal formation*
- 2014 The Formation of the Solar System Workshop, Max-Planck-Institut für Radioastronomie, Bonn, Germany  
*Studies of gas-particle interaction: implications for streaming instabilities*
- 2013 Astrophysical Turbulence: From Galaxies to Planets, MPI for the Physics of Complex Systems, Dresden, Germany  
*Gas-particle interaction and instability in protoplanetary disks*
- 2013 European Turbulence Conference (ETC14), ENS Lyon, France  
*Experimental studies of gas-particle interaction relevant to planet formation*
- 2011 American Astronomical Society Meeting, Boston, MA, USA  
*Optical and infrared monitoring of KH 15D*

## OUTREACH, SCIENCE COMMUNICATION, AND PUBLIC ENGAGEMENT

### Science and Art

- 2021 **Short Film** — *Dust Puzzles*  
First Place Winner, 4th Global Science Film Festival  
<https://magicssciencepro.com/dustpuzzles>
- 2007 **Art–Science Consultant** — Installation Art: *All the Dead Stars*  
Katie Paterson  
<https://katiepaterson.org/artwork/all-the-dead-stars/>

### Public Speaking and Educational Programs

- 2025 **Public Lecture** — Columbia University Alumni Event, Space Hub Zurich  
*The New Space Economy*  
[https://switzerland.alumni.columbia.edu/space\\_economy](https://switzerland.alumni.columbia.edu/space_economy)
- 2023 **National STEM Outreach** — Schweizer Nationaler Zukunftstag  
*Ein Tag als Chefin: Prinzipien der Schwerelosigkeit*  
<https://www.nationalerzukunftstag.ch/>
- 2022 **Public Science Event** — Fantasy Basel, Space Stage  
<https://fantasybasel.ch/en/sci-fi-space>
- 2021 **Public Science Discussion** — Space Café, University of Zurich  
*Uncommon Environments in the Laboratory*  
<https://www.spacehub.uzh.ch/en/events/SpaceCafe/2021/uncommon-environments.html>
- 2008–2009 **Public Outreach Program** — Columbia University Astronomy Public Nights  
<http://outreach.astro.columbia.edu/index.html>

### Interviews and Media

- 2023 **Podcast Interview** — *The LiUniverse*  
<https://theliuniverse.podbean.com/e/planet-formation-with-dr-holly-capelo/>
- 2020 **Video Interview** — Space Hub Zurich  
<https://www.youtube.com/watch?v=zMunyVKWdes>
- 2020 **Press Feature** — 4th Swiss Parabolic Flight Campaign  
<https://nccr-planets.ch/blog/2020/06/15/planetary-research-in-weightlessness/>
- 2019 **Press Announcement** — NCCR PlanetS New Initiatives  
<https://nccr-planets.ch/blog/2019/12/12/new-initiatives/>

### Writing

- 2012 **Guest Author** — *Astrobites*  
<http://astrobites.org/2011/07/17/careers-like-space-missions-are-tricky-how-a-masters-degree-can-help/>
- 2010–2012 **Founder & Contributor** — *The Error Bar*  
<https://ebar.blogs.wesleyan.edu/>
- 2010 **Feature Articles** — *Seed Magazine*  
*Beneath the Surface*  
[https://web.archive.org/.../beneath\\_the\\_surface](https://web.archive.org/.../beneath_the_surface)  
*Symbols from the Sky*  
[https://web.archive.org/.../symbols\\_from\\_the\\_sky](https://web.archive.org/.../symbols_from_the_sky)  
*The Second Place Sex*  
[https://web.archive.org/.../the\\_second-place-sex](https://web.archive.org/.../the_second-place-sex)