

Dr. Marcel Padilla

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ETH Zürich, Switzerland · October 2026

Languages: German (native) · English (C2) · Spanish (native)

🐙 GitHub · in LinkedIn · 🎓 Scholar · 🆔 ORCID · 📺 YouTube

Website: 🖱



marcelpadilla.com

*Machine Learning · Numerics · Discrete Differential Geometry · Geometry Processing · Physical Simulation
Fluids · Gaussian Splatting · Computer Graphics · Teaching*

Work Experience

Postdoctoral researcher

ETH Zürich

Institute of Computer Science; Interactive Geometry Lab.

Oct 2024 – Sep 2026

- Developed fast multigrid solvers for tetrahedral meshes in C++ (*GravoTet*, Best Paper at SMI 2026).
- Research on geometry processing, numerics, machine learning, fluids, and physical simulation.
- Co-authored SIGGRAPH projects on neural low-poly stylization via score distillation (2026) and kirigami tessellations (2025).
- Associate lecturer for the course *Shape Modeling and Geometry Processing* (2025 & 2026).

Postdoctoral researcher

TU Berlin

Institute of Mathematics; Discretization in Geometry and Dynamics.

Sep 2023 – Jul 2024

- Co-authored *Going with the Flow* (SIGGRAPH 2024): fast motion of solid bodies immersed in fluids via lift, drag, and added mass, without simulating the fluid.
- Wrote a successful research grant proposal, the Feodor Lynen Research Fellowship from the Alexander von Humboldt Foundation, funding the ETH Zürich position.

Doctoral researcher

Caltech & TU Berlin

Institute of Mathematics; supervised by Peter Schröder & Ulrich Pinkall

May 2018 – Sep 2023

- First-authored *Filament Based Plasma* (SIGGRAPH 2022, core of the dissertation): solar plasma simulation via magnetohydrodynamics and discrete exterior calculus.
- First-authored *On Bubble Rings and Ink Chandeliers* (SIGGRAPH 2019): underwater bubble and ink simulation via vortex filament dynamics.
- Co-authored *Motion from Shape Change* (SIGGRAPH 2023, locomotion in viscous fluids) and *4D Atlas* (IEEE TPAMI, statistical shape analysis).

Student Assistant

TU Berlin

Institute of Mathematics.

Dec 2014 – Jul 2017

- Developer on the *jReality* 3D visualization software (Java).
- Tutoring and tutorials for mathematics and graphics courses.

Awards, Funding and Memberships

Best Paper Award

NEW: Issued by *Shape Modeling International (SMI)*, for the publication *GravoTet*

Jul 2026

Feodor Lynen Research Fellowship

Postdoctoral research fellowship of the Alexander von Humboldt Foundation

Oct 2024 – Sep 2026

SFB Transregio 109 “Discretization in Geometry and Dynamics”

Funded research position at TU Berlin

Mar 2021 – Jul 2024

TU Berlin PhD scholarship <i>Funded through an Einstein Foundation visiting fellowship</i>	May 2018 – Feb 2021
German Academic Scholarship Foundation <i>Student scholarship, Studienstiftung des Deutschen Volkes</i>	Mar 2016 – May 2018
KAUST internship initiative <i>Host funded internship at the Visual Computing Center</i>	Feb – Apr 2018
Overseas exchange scholarship from the TU Berlin <i>For an exchange to Sophia University in Tokyo, Japan</i>	Sep 2017 – Feb 2018
3× DAAD rise worldwide scholarships <i>Internships at institutes in Estonia, India, and Australia (details below)</i>	2014, 2015, & 2016
Erasmus exchange scholarship from the EU <i>For an exchange to Durham University, United Kingdom</i>	Sep 2013 – Jul 2014
Berlin Mathematical School and Math+ <i>PhD Phase II student membership</i>	May 2018 – Sep 2023

Publications

- **NEW: GravoTet: A Fast Multigrid Hierarchy Construction for Tetrahedral Meshes**, [SMI 2026 \(Computers & Graphics\)](#)
Marcel Padilla, Ruben Wiersma, Tim Huisman, Jackson Campolattaro, Olga Sorkine-Hornung, Klaus Hildebrandt. Computers & Graphics, Vol. 138, Art. 104662, [10.1016/j.cag.2026.104662](https://doi.org/10.1016/j.cag.2026.104662)
- **NEW: Gradient Descent in the ALPS: Abstracted Low-Poly Stylization and Fabrication**, [SIGGRAPH 2026](#)
Ruben Wiersma, Alexandre Binninger, Peizhuo Li, Tanguy Magne, Annika Oehri, Aviv Segall, Danielle Luterbacher, Marcel Padilla, Jing Ren, Olga Sorkine-Hornung. ACM SIGGRAPH 2026 Conference Papers. [Project PDF](#)
- **NEW: Reconfigurable Hinged Kirigami Tessellations**, [SIGGRAPH Asia 2025](#)
Aviv Segall, Jing Ren, Marcel Padilla, Olga Sorkine-Hornung. ACM SIGGRAPH Asia 2025 Conference Papers. [Project PDF](#)
- **Going with the Flow**, [SIGGRAPH 2024](#)
Yousuf Soliman, Marcel Padilla, Oliver Gross, Felix Knöppel, Ulrich Pinkall, Peter Schröder. ACM Transactions on Graphics, Vol. 43, No. 4, [10.1145/3658164](https://doi.org/10.1145/3658164)
- **The solar corona: modeled, discretized, visualized**, [PhD Thesis](#)
Marcel Padilla, Defended on 25th September 2023, [10.14279/depositonce-18889](https://doi.org/10.14279/depositonce-18889)
- **Motion From Shape Change**, [SIGGRAPH 2023](#)
Oliver Gross, Yousuf Soliman, Marcel Padilla, Felix Knöppel, Ulrich Pinkall, Peter Schröder. ACM Transactions on Graphics, Vol. 42, No. 4, [10.1145/3592417](https://doi.org/10.1145/3592417)
- **4D Atlas: Statistical Analysis of the Spatiotemporal Variability in Longitudinal 3D Shape Data**, [IEEE Transactions on Pattern Analysis and Machine Intelligence](#)
Hamid Laga, Marcel Padilla, Ian H. Jermyn, Sebastian Kurtek, Mohammed Bennamoun, Anuj Srivastava. vol. 45, no. 2, pp. 1335-1352, 1 Feb. 2023, [10.1109/TPAMI.2022.3163720](https://doi.org/10.1109/TPAMI.2022.3163720)
- **Filament Based Plasma**, [SIGGRAPH 2022](#)
Marcel Padilla, Oliver Gross, Felix Knöppel, Albert Chern, Ulrich Pinkall, Peter Schröder. ACM Transactions on Graphics, Vol. 41, No. 4, Art. 153, [10.1145/3528223.3530102](https://doi.org/10.1145/3528223.3530102)
- **On Bubble Rings and Ink Chandeliers**, [SIGGRAPH 2019](#)
Marcel Padilla, Albert Chern, Felix Knöppel, Ulrich Pinkall, Peter Schröder. ACM Transactions on Graphics,

Vol. 38, No. 4, Art. 129, [10.1145/3306346.3322962](https://doi.org/10.1145/3306346.3322962)

- **The Nearest Hermitian Inverse Eigenvalue Problem Solution with Respect to the 2-Norm**
Marcel Padilla, Benedikt Kolbe, Aniruddha Chakraborty (2017). [arXiv:1703.00829](https://arxiv.org/abs/1703.00829)
- **A.C.T.I.V.E.: A Scalable Superellipsoid-based CFD Visualization for Virtual and Desktop Environments**, [EuroVR 2014](#)
Heiko Herrmann, Marcel Padilla, and Emiliano Pastorelli (2014). The Eurographics Association.
[10.2312/eurovr.20141344](https://doi.org/10.2312/eurovr.20141344)
- **Komplexe Funktionen darstellen**, [Junge Wissenschaft](#)
Marcel Padilla. Youth research magazine [issue Nr. 94](#), 2012

Education

PhD in Mathematics

Thesis title: "The Solar Corona: Modeled, Discretized, Visualized"

Caltech & TU Berlin

May 2018 – Sep 2023

MSc in Mathematics

Thesis title: "Point Vortex Dynamics on Closed Surfaces"

TU Berlin

Jun 2016 – May 2018

BSc in Mathematics

Thesis title: "Zeros of Random Sections on Line Bundles"

TU Berlin

Oct 2012 – Jun 2016

Research Visits, Teaching & Exchanges

Visiting Researcher

California Institute of Technology

Department of Mathematics

Research visit. Supervisor: Peter Schröder

Pasadena, United States

Jul-Sep 2019

Leicester University

Department of Mathematics

Implementing minimal and cmc surfaces. Supervisor: Katrin Leschke

Leicester, United Kingdom

Jan 2019

King Abdullah University of Science and Technology

KAUST internship program

Wood fracture dynamics. Supervisor: Dominik L. Michels

Thuwal, Saudi Arabia

Feb 2018 – Apr 2018

Murdoch University

DAAD rise worldwide scholarship

Machine learning on 4D shape analysis. Supervisor: Hamid Laga

Perth, Australia

Aug 2016 – Oct 2016

Indian Institute of Technology Mandi

DAAD rise worldwide scholarship

Numerical methods for inverse eigenvalue problems. Supervisor: Aniruddha Chakraborty

Mandi, India

Aug 2015 – Oct 2015

Tallinn University of Technology

DAAD rise worldwide scholarship

Tensor field visualization in VR. Supervisor: Heiko Herrmann

Tallinn, Estonia

Jul 2014 – Sep 2014

Teaching

Shape Modeling and Geometry Processing

Associate lecturer for the university course, ETH Zürich

Zürich, Switzerland

2025 – 2026

Student Mentoring

Various Topics, TU Berlin

Berlin, Germany

Winter 2018 - 2024

The Art of Presenting <i>Workshop on presentations in academia at BMS/Math+, TU Berlin</i>	Berlin, Germany <i>Winter 2019 & 2020</i>
Geometry Processing and Applications <i>Tutorials and several lectures, TU Berlin</i>	Berlin, Germany <i>Winter 2019/2020</i>
Houdini Tutorials Tailored for Mathematicians <i>Online tutorials and course guide, TU Berlin</i>	Berlin, Germany <i>2016 - Current</i>
Mathematik für Physiker I <i>Tutor classes, TU Berlin</i>	Berlin, Germany <i>Winter 2015/2016</i>
Teaching Assistant <i>Volunteer, Multicultural Youth and Integration Center "mji e.V."</i>	Berlin, Germany <i>2012 – 2015</i>

Study Exchange

Sophia University <i>Overseas exchange scholarship from the TU Berlin</i>	Tokyo, Japan <i>Sep 2017 – Feb 2018</i>
Durham University <i>Erasmus exchange scholarship from the EU</i>	Durham, United Kingdom <i>Sep 2013 – Jul 2014</i>

Conference Presentations & Talks

- Shape Modeling International (SMI) 2026, Istanbul. *GravoTet: A Fast Multigrid Hierarchy Construction for Tetrahedral Meshes.*
- IGL Seminar at ETH Zürich 2023. *Filament Based Plasma.*
- ACM SIGGRAPH 2022. *Filament Based Plasma.* [View on Youtube](#)
- ACM SIGGRAPH 2019. *On Bubble Rings and Ink Chandeliers.* [View on Youtube](#).
- EuroVR 2014, The Eurographics Association. *A.C.T.I.V.E. A Scalable Superellipsoid-based CFD Visualization for Virtual and Desktop Environments.*

Technical and Personal Skills

Languages

English: C2 (*excellent command*) · **German:** native · **Spanish:** native
Italian: beginner · **French:** beginner

Programming Languages and Software

Main computation tools: Python, C++, Houdini VEX, Agentic coding
Experienced: Java, JavaScript, HTML, CSS, MATLAB

Volunteering

Foodsharing association <i>Saving and distributing surplus food</i>	Berlin, Germany <i>2019 – current</i>
Arbeiter-Samariter-Bund <i>Kitchen staff, refugee emergency housing (Rathaus Wilmersdorf)</i>	Berlin, Germany <i>2015 – 2017</i>
St. John Ambulance Society <i>First aid response team</i>	Durham, UK <i>2013 – 2014</i>
Multicultural Youth and Integration Center "mji e.V." <i>Volunteer, Homework helper</i>	Berlin, Germany <i>2012 – 2015</i>