

## Particulars

Last Name	Zürcher
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## Education

2016 – 2018	M.Sc. in Interdisciplinary Sciences, ETH Zurich, Switzerland <i>Major: Physics, Minor: Physical Chemistry</i>
2013 – 2016	B.Sc. in Interdisciplinary Sciences, ETH Zurich, Switzerland <i>Major: Physics, Minor: Physical Chemistry</i>

## Work

2018 – present	PhD in Physics, ETH Zurich, Switzerland <i>Area: Computational Astrophysics</i> <i>Supervisor: Alexandre Refregier</i>
2019 – 2022	Cryptologist for Swiss Army, Switzerland (seasonal)

## Languages

German (Mother-tongue)  
English (C2 Level)  
French (B1 Level)  
Japanese (Basic knowledge)

## Programming/IT skills

I am a computer enthusiast interested in particular in the Linux operating system and data science.

Due to my interest in Linux I acquired some knowledge about the inner workings of operating systems in general as well as some basic system administrator skills. I use different programming languages in my daily work, but I work primarily with Python.

In particular, I am familiar with libraries used for data visualization (matplotlib, seaborn), data analysis and scientific computing (numpy, pandas, scipy), machine learning (scikit-learn, tensorflow, keras) and high performance computing (mpi4py, numba, emcee, h5py, Cython).

In my research I use state-of-the-art supercomputers to run massively parallelized simulations and big data analyses.

Thanks to my work I acquired an efficient workflow and learned the basics of software engineering, code testing and CI/CD (git, gitlab CI).

During my work for the Swiss army I learned the basics of cryptology and OpenCL.

#### Programming languages:

General	Python (advanced), C/C++ (intermediate), R (basics)
DDL/DML	PostgreSQL, Spark (basics)
Web development	HTML, CSS, JavaScript (basics)
Others	Scripting/Bash (intermediate), LaTeX (intermediate)

### **Other work-related skills**

Quantitative data analysis, scientific computing, statistics, data compression, Principal Component Analysis (PCA), Approximate Bayesian Computation (ABC), Gaussian processes, data visualization, cryptology, basic knowledge about machine learning and deep neural networks, software development, CI/CD, project management, teamwork, SCRUM

### **Publications/Research projects**

#### Publications:

Zürcher, Dominik, et al. “Dark Energy Survey Year 3 results: Cosmology with peaks using an emulator approach” Monthly Notices of the Royal Astronomical Society 511.2 (2022): 2075-2104.

Doux, Cyrille, “Dark Energy Survey Year 3 results: cosmological constraints from the analysis of cosmic shear in harmonic space” arXiv preprint arXiv:2203.07128 (2022).

Secco, Lucas, et al. “Dark Energy Survey Year 3 Results: Three-Point Shear Correlations and Mass Aperture Moments” arXiv preprint arXiv:2201.05227 (2022).

Kovacs, Alexander, et al. “The DES view of the Eridanus supervoid and the CMB Cold Spot” Monthly Notices of the Royal Astronomical Society 510.1 (2022): 216-229.

Jeffrey, Niall, et al. “Dark Energy Survey Year 3 results: curved-sky weak lensing mass map reconstruction” Monthly Notices of the Royal Astronomical Society 505.3 (2021): 4626-4645.

Gatti, Marco, et al. “Dark Energy Survey Year 3 results: cosmology with moments of weak lensing mass maps” arXiv preprint arXiv:2110.10141 (2021)

Sgier, Raphael, et al. “Combined 13x2-point analysis of the Cosmic Microwave Background and Large-Scale Structure: implications for the S8-tension and neutrino mass constraints” arXiv preprint arXiv:2110.03815 (2021)

Zürcher, Dominik, et al. “Cosmological forecast for non-Gaussian statistics in large-scale weak lensing surveys” *Journal of Cosmology and Astroparticle Physics* 2021.01 (2021): 028.

Fagioli, Martina, et al. “Spectro-imaging forward model of red and blue galaxies” *Journal of Cosmology and Astroparticle Physics* 2020.06 (2020): 050.

Zürcher, Dominik, and Surhud, More. “The splashback radius of Planck SZ clusters” *The Astrophysical Journal* 874.2 (2019): 184.

#### Other research projects:

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|------|---|
| 2018 | Master thesis in research group of Masahiro Takada at University of Tokyo, Tokyo, Japan |
| 2016 | Bachelor thesis in research group of Andre Rubbia at CERN, Geneva, Switzerland          |

## Teaching

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| 2022 | Physics I for material scientists at ETH Zurich, Switzerland              |
| 2021 | Physics II for chemists and chemical engineers at ETH Zurich, Switzerland |
| 2020 | Physics II for electrical engineers at ETH Zurich, Switzerland            |
| 2020 | Astrophysics II at ETH Zurich, Switzerland                                |
| 2019 | Physics I for physicists at ETH Zurich, Switzerland                       |
| 2019 | Astrophysics II at ETH Zurich, Switzerland                                |

## Supervision

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|------|---|
| 2022 | Master thesis of a student in the Cosmology Research Group ETH Zurich, Switzerland    |
| 2021 | Master thesis of a student in the Cosmology Research Group ETH Zurich, Switzerland    |
| 2020 | Master thesis of a student in the Cosmology Research Group ETH Zurich, Switzerland    |
| 2019 | Bachelor thesis of a student in the Cosmology Research Group ETH Zurich, Switzerland  |
| 2018 | Semester project of a student in the Cosmology Research Group ETH Zurich, Switzerland |

## Hobbies

Mountaineering, weight-lifting, running, skiing

## External resources

[Personal webpage](#)  
[GitHub](#)

[ETH Gitlab](#)  
[esub-epipe](#)  
[estats](#)  
[NGSF](#)  
[ekit](#)