

# David Simonne

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## Education

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### Preparatory class in mathematics, physics and chemistry

*Caen, France*

LYCÉE MALHERBE

2013-2014

After graduating from high school, I started a program meant to prepare young students for a national exam that will then determine in which school one might pursue a degree in engineering in France. The curriculum is mostly composed of mathematics (12h/week), physics and chemistry (8h/week), engineering sciences, computer science (4h/week), and languages (6h/week). After completing the first year, I had realised that my interests truly lie in understanding the small things, and so my path changed. Nevertheless, this first year provided a strong background in mathematics, physics and chemistry that would prove useful for the following years.

### Bachelor of Science in Physics Mention Bien

*Rennes, France*

UNIVERSITY OF RENNES 1

2014-2016

After a first year focused on mathematics, physics, and chemistry, I converted my credits to join the second year of a bachelor's program in Physics. The courses in the University of Rennes 1 were focused on electromagnetism, classical and quantum mechanics, thermodynamics, solid-state physics, optics, crystallography, nuclear physics, mathematics for physics, programming, and English. I also completed additional elective courses on materials science and chemistry. An Erasmus+ scholarship was granted to the Pr. Dr. Laurent Guérin to send one student to the University of Tohoku in Japan as a result of a partnership between laboratories in Rennes and Sendai. Highly motivated, I wanted to prove myself during my Bachelor thesis and succeeded in finding a project at the Technical University of Munich.

### COLABS - Cooperative Laboratory Study Program

A+

*Sendai, Japan*

UNIVERSITY OF TOHOKU

2016-2017

After receiving a scholarship from the University of Rennes 1 to study in Sendai, I registered for the COLABS program. This master's program consists of 60% laboratory training time, during which the student participates in lab activities such as seminars or experiments, and participates in lectures for the rest of the time. I followed elementary particle physics, quantum field theory, materials science, and engineering courses. Additionally, I followed Japanese culture and language courses throughout the week.

### Master in Materials Science Exploring Large Scale Facilities (MaMaSELF) - First year

15.6/20

*Rennes, France*

UNIVERSITY OF RENNES 1

2017 - 2018

Coming back from Japan, I registered for a master's program in materials science which specializes in the use of large-scale facilities: MaMaSELF (Master in Materials Science Exploring Large-scale Facilities). The program is financed by Erasmus+ grants and is meant to facilitate study mobilities during the formation of future researchers in materials science. During the first year in Rennes, courses were given in crystallography, solid-state physics and chemistry, quantum physics, metals and alloys, and numerical methods. We also had courses given by visiting experts, including Dr. Yu-Sheng Chen from the advanced photon source (APS) in Chicago, who lectured on synchrotrons, and Dr. An-Pang Tsai from the University of Tohoku, who gave an exciting talk about quasicrystals.

### MaMaSELF - Second year - First semester

178/180 - 29.66/30

*Torino, Italy*

UNIVERSITY OF TORINO

2018 - 2019

I spent the first semester of the second year of my master's program in Turin, following a curriculum focused on spectroscopy, metallurgy, and crystallography. The curriculum included laboratory courses in which we synthesized dye-sensitized solar cells (DSSC). Another group project focused on finding the most appropriate materials for one specific application; in our case, the application was that of a hip prosthesis. Having found the courses in metallurgy in both Rennes and Torino interesting, I decided to pursue research in a related subject for the master thesis, at the Technical University of Munich.

## MaMaSELF - Master Degree - Thesis and final degree

29/30 (IT) - 1.71 (Ge)

Munich

LUDWIG-MAXIMILIAN UNIVERSITÄT / TECHNISCHE UNIVERSITÄT MÜNCHEN

26 July 2019

Diploma supplement - 09/11, Rennes.

Preliminary Certificate - 04/12, Munich

The procedure for the obtainment of the Italian diploma is due to be completed in December. The graduation mark indicated for the purpose of this application is the German grade for the Master degree (1.71) converted to Italian standards (29/30).

## Courses

**Courses** Quantum Physics, Solid-state Physics, Crystallography, Spectroscopy, Neutron and X-Ray Diffraction, Metallurgy, Material Science, Solid-state Chemistry, Electromagnetism, Mathematics, Classical Mechanics, Optics, Nuclear Physics, Elementary Particle Physics, Effective Computer Science for Physics.

## Experience

### FRM-II

Garching bei Munchen, Germany

BACHELOR THESIS

May 2016 - June 2016

- **First approach to applied physics.** Dr. Jean-François Moulin, instrument responsible for REFSANS was my advisor throughout the Bachelor thesis. It was my first experience with large-scale facilities, specifically utilizing the instrument REFSANS situated inside the instrumental hall of the FRM-II neutron source. During that time in Munich, I learned about applied physics, more specifically about neutron and X-Ray diffraction. My project first consisted in the creation of a heating-cell that was to be used inside a diffractometer and secondly in the optimization of the experimental process involving a cell designed to perform solid-liquid interfaces experiments inside the neutron reflectometer. These months in a research facility confirmed my interest in materials science with a preference for theoretical studies and ideas that could then be further examined through state of the art instruments.

### Tohoku University

Sendai, Japan

STUDENT RESEARCH PROJECT

May 2016 - June 2016

- I spent two semesters in Japan, under the supervision of Pr. Dr. Shinichiro Iwai inside the Ultrafast Spectroscopy laboratory. I worked closely with Japanese students on different topics such as *Excitation Intensity Dependence of Ultrafast Carrier Dynamics in GaAs* during the first semester and *Primary Dynamics of Photo-Induced Phase Transition in V2O3* during the second semester. That year in Japan was probably when I learned the most about performing in a laboratory, giving presentations (I gave two poster presentations and a final presentation), seminars (the group organized the sixth international conference on PhotoInduced Phase transitions - PIPT 6), writing abstracts, and writing technical reports. Overall, my time in Japan amounted to a very important year that allowed me to understand what exactly a researcher does and how he does it.

### Uppsala Universitet

Uppsala, Sweden

INTERN

May 2018 - June 2018

- **Neutron diffraction and data analysis.** To complete the first year of MaMaSELF, I stayed in Uppsala University in the famous Angström Laboratoriet. My advisor, Dr. Max Wolff, had given me the task to analyze a set of SANS data on micellar systems that was recorded in Australia at the Platypus instrument by a PhD student. The resulting work was published and can be found in the "publications" section above. Overall, it was an interesting project with a first approach to data analysis using Python, large-scale facilities datasets and writing for publishing. The contact with Dr. Nelson from Platypus very much enriched my knowledge of Python. Moreover, a summer school given by Dr. Wolff on neutron diffraction brought several students, myself included, to the Laboratoire Léon Brillouin in Saclay near Paris. There, we could perform some experiments with SANS and the Triple-axis Spectrometer, under the supervision of Dr. Fabrice Cousin who was kind enough to take the time to show us how these instruments worked. This internship was possible thanks to the support of the "Fondation Rennes 1" through a scholarship.

### Technical University of Munich

Garching bei Munchen, Germany

MASTER THESIS

March 2019 - September 2019

- **Atomic ordering in Heusler alloys and neutron diffraction.** To complete my master's degree in materials science, I chose to study neutron diffraction under the supervision of Dr. Michael Leitner. I spent six months with a group belonging to both the Department of Physics of the Technical University of Munich and to FRM-II, the neutron research facility on campus. My topic, "Neutron diffraction in Heusler alloys," was split into two parts. First, the correction of neutron diffraction data sets that originated from a previous experiment at the LLB, a neutron research facility in Saclay near Paris, by the means of process modeling and least squares regression. New models were then refined on the corrected data sets and information was extracted on the ordering process of Ni(2-x)MnSb. All programs were written in Python. Furthermore, I accompanied a PhD student from my laboratory to Grenoble, where I could participate in small-angle neutron scattering (SANS) measurements on a related topic, "Magnetic and chemical microstructures of Mn-based Heusler compounds studied by SANS," at the Institut Laue Langevin (ILL).

## Università degli Studi di Torino

Torino, Italy

RESEARCH ASSISTANT

January 2020 - December 2020

**Cutting-edge X-ray methods and models for the understanding of surface site reactivity in heterogeneous catalysts and sensors.** I moved back to Torino in January 2020 for a project that entails X-Ray Absorption Spectroscopy and data analysis with Python. I currently work within the department of Physical Chemistry of the University of Torino with Prof. Dr. Gabriele Ricchiardi, Dr. Elisa Borfecchia and Andrea Martini. My current interests lie in Diffraction, Spectroscopy and programming methods such as Machine Learning.

## La Poste Française

Avranches, France

MAILMAN, FRANCE

Summer 2015, 2016, 2018

- Distribution and sorting of the mail.

## Projects

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### Publication

DOI

WOLFF, M.; SAINI, A.; SIMONNE, D.; ADLMANN, F.; NELSON, A.

2019

- Time Resolved Polarised Grazing Incidence Neutron Scattering from Composite Materials. *Polymers* **2019**, 11, 445.

### Publication

SIMONNE D.; LEITNER M.

2020

- Diffraction investigation of the half-Heusler to full-Heusler transition in Ni(2-x)MnSb (in writing)

### Publication

SIMONNE D.; MARTINI A. *et al.*

2020

- THORONDOR: a software for quick treatment and analysis for low energy XAS data, *Journal of Synchrotron Radiation, Computer Programs* **2020**, 27.

### Website

[dsimonne.eu](http://dsimonne.eu)

DAVID SIMONNE

- Personal website, with a professional counterpart where a detailed version of the CV can be found, as well as different documents relevant to the cursus.

## Skills

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**Programming Languages** Python, HTML, CSS, PHP, Git, SQL, BASH

**Writing** Documents with LaTeX, Poster or slides with Powerpoint

**Languages** French (native), English (C2, TOEFL: 109/120), German (Native), Japanese (N4), Italian (B1)