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Scientific Experience

- 2022 – now 📌 **Research fellow**, CERN / ISOLDE, local leader of the MIRACLS experiment
- 2021 – 2022 📌 **PostDoc researcher**, McGill University & CERN / ISOLDE, laser spectroscopy at the MIRACLS experiment
- 2017 – 2021 📌 **Ph.D.**, CERN / ISOLDE, laser spectroscopy at the MIRACLS and COLLAPS experiments

Education

- 2017 – 2021 📌 **Ph.D.**, CERN / ISOLDE, Switzerland and TU Wien, Austria
Thesis title: *Laser Spectroscopy of Antimony Isotopes and the Design of a Cryogenic Paul Trap*
- 2015 – 2017 📌 **M.Sc. Technical Physics**, TU Wien and MedAustron, Austria
Thesis title: *PHITS Modelling of an Experimental Setup for Proton Radiotherapy using an Anthropomorphic Phantom*
- 2011 – 2015 📌 **B.Sc. Technical Physics**, TU Wien, Austria
Thesis title: *Critical Current Densities of a $GdBa_2Cu_3O_7$ Coated Conductor with ISD - MgO Buffer Layer*
- 2005 – 2010 📌 **Higher Technical Training and Research Institute (HTL)**, Wiener Neustadt, Austria
Specialization: *Electrical Engineering*

Scholarships

- 2022 📌 **CERN Research Fellowship**, Experimental Physics
- 2017 📌 **Austrian Doctoral Student Programme at CERN**, funds doctoral students at CERN for a duration of 3 years

Skills

- Languages 📌 German - native, English - fluent, French - advanced
- Coding 📌 Python, \LaTeX , Lua, EPICS, C, C++, Fortran, gnuplot
- Software 📌 Linux, SIMION, Inkscape, Autodesk Inventor, Labview, Windows, various office applications, PHITS (Particle and Heavy Ion Transport code System)
- Courses 📌 Scientific writing, Fast Forward - the productivity system for researchers, Mobile Elevating Work Platform (MEWP), Overhead crane, Working at heights, Supervision
- Hands-on 📌 Working with lasers: Dye and Ti:Sa cw laser, frequency doubling, fiber coupling, etc., UH-vacuum application, Beam line assembly, Handling liquid helium for superconducting magnets

Research Publications and Conference Contributions

Journal Articles

- 1 **S. Lechner** et al., “Simulations of a cryogenic, buffer-gas filled Paul trap for low-emittance ion bunches”, submitted in *Nucl. Instrum. Methods Phys. Res. A: Accel. Spectrom. Detect. Assoc. Equip.* (2024).
- 2 **S. Lechner** et al., “Electromagnetic moments of the antimony isotopes $^{112-133}\text{Sb}$ ”, *Phys. Lett. B* **847**, 138278 (2023).
- 3 F. Maier et al., “Increased beam energy as a pathway towards a highly selective and high-flux MR-ToF mass separator”, *Nucl. Instrum. Methods Phys. Res. A: Accel. Spectrom. Detect. Assoc. Equip.* **1056**, 168545 (2023).
- 4 F. Maier et al., “Simulation studies of a 30-keV MR-ToF device for highly sensitive collinear laser spectroscopy”, *Nucl. Instrum. Methods Phys. Res. A: Accel. Spectrom. Detect. Assoc. Equip.* **1048**, 167927 (2023).
- 5 P. Plattner et al., “Nuclear charge radius of ^{26m}Al and its implication for V_{ud} in the quark mixing matrix”, *Phys. Rev. Lett.* **131**, [10.1103/physrevlett.131.222502](https://doi.org/10.1103/physrevlett.131.222502) (2023).
- 6 S. Sels et al., “Doppler and sympathetic cooling for the investigation of short-lived radioactive ions”, *Phys. Rev. Res.* **4**, [10.1103/physrevresearch.4.033229](https://doi.org/10.1103/physrevresearch.4.033229) (2022).
- 7 V. Lagaki et al., “An accuracy benchmark of the MIRACLS apparatus: Conventional, single-passage collinear laser spectroscopy inside a MR-ToF device”, *Nucl. Instrum. Methods Phys. Res. A: Accel. Spectrom. Detect. Assoc. Equip.* **1014**, 165663 (2021).
- 8 **S. Lechner** et al., “Probing the single-particle behavior above ^{132}Sn via electromagnetic moments of $^{133,134}\text{Sb}$ and $N = 82$ isotones”, *Phys. Rev. C* **104**, [10.1103/physrevc.104.014302](https://doi.org/10.1103/physrevc.104.014302) (2021).
- 9 A. Kanellakopoulos et al., “Nuclear moments of germanium isotopes near $N = 40$ ”, *Phys. Rev. C* **102**, [10.1103/physrevc.102.054331](https://doi.org/10.1103/physrevc.102.054331) (2020).
- 10 L. V. Rodríguez et al., “Doubly-magic character of ^{132}Sn studied via electromagnetic moments of ^{133}Sn ”, *Phys. Rev. C* **102**, [10.1103/physrevc.102.051301](https://doi.org/10.1103/physrevc.102.051301) (2020).
- 11 S. Sels et al., “First steps in the development of the Multi Ion Reflection Apparatus for Collinear Laser Spectroscopy”, *Nucl. Instrum. Methods Phys. Res. B: Beam Interact. Mater. At.* **463**, 310–314 (2020).
- 12 D. Yordanov et al., “Instrumentation for high-resolution laser spectroscopy at the alto radioactive-beam facility”, *J. Instrum.* **15**, Po6004–Po6004 (2020).
- 13 D. T. Yordanov et al., “Structural trends in atomic nuclei from laser spectroscopy of tin”, *Commun. Phys.* **3**, [10.1038/s42005-020-0348-9](https://doi.org/10.1038/s42005-020-0348-9) (2020).
- 14 C. Gorges et al., “Laser spectroscopy of neutron-rich tin isotopes: a discontinuity in charge radii across the $N = 82$ shell closure”, *Phys. Rev. Lett.* **122**, [10.1103/physrevlett.122.192502](https://doi.org/10.1103/physrevlett.122.192502) (2019).
- 15 **S. Lechner** et al., “Fluorescence detection as a new diagnostics tool for electrostatic ion beam traps”, *Hyperfine Interact.* **240**, [10.1007/s10751-019-1628-1](https://doi.org/10.1007/s10751-019-1628-1) (2019).
- 16 F. M. Maier et al., “Simulations of a proof-of-principle experiment for collinear laser spectroscopy within a multi-reflection time-of-flight device”, *Hyperfine Interact.* **240**, [10.1007/s10751-019-1575-x](https://doi.org/10.1007/s10751-019-1575-x) (2019).

Invited Oral Presentations

- 1 DESIR workshop 2024, *Spectroscopic opportunities using the MIRACLS technique and laser cooling*, Caen, France, Feb. 2024.

- 2 ISOLDE Workshop and Users meeting 2023, *MIRALCS – A novel laser spectroscopy technique for observing the most exotic nuclides*, Geneva, Switzerland, Nov. 2023.

Conference Organization

- 1 Early Career Conference in Trapped Ions (ECCTI) 2024, *Member of organizing committee*, Innsbruck, Austria, July 2024.
- 2 ISOLDE Workshop and Users meeting 2023, *Member of organizing committee*, Geneva, Switzerland, Nov. 2023.
- 3 Early Career Conference in Trapped Ions (ECCTI) 2022, *Member of scientific and organizing committee*, Geneva, Switzerland, June 2022.

Oral Presentations




- 1 Advances in Radioactive Isotope Science (ARIS), *Electromagnetic moments of the antimony ($Z=51$) isotopic chain $^{112-133}\text{Sb}$ in comparison to shell-model and ab initio calculations*, Avignon, France (June 2023).
- 2 Mazurian Lakes Conference on Physics, *Electromagnetic moments of the antimony ($Z=51$) isotopic chain $^{112-133}\text{Sb}$ in comparison to shell-model and ab initio calculations*, Piaski, Poland (Sept. 2023).
- 3 International Nuclear Physics Conference (INPC), *A novel laser spectroscopy technique for observing the most exotic nuclides*, Cape Town, South Africa (Sept. 2022).
- 4 ISOLDE Workshop and Users meeting 2022, *MIRALCS - Probing exotic nuclei via laser spectroscopy in an MR-ToF device*, Geneva, Switzerland (Dec. 2022).
- 5 Early Career Conference in Trapped Ions (ECCTI), *Combining a cryogenic Paul trap and an electrostatic ion beam trap to explore the most exotic nuclides with high-resolution laser spectroscopy*, Geneva, Switzerland (Jan. 2020).
- 6 Vth Topical Workshop on Modern Aspects in Nuclear Structure, *Exploring the antimony ($Z = 51$) isotopic chain with laser spectroscopy*, Bormio, Italy (Feb. 2020).
- 7 DPG Spring Meeting, *MIRALCS: The Multi Ion Reflection Time of Flight Apparatus for Collinear Laser Spectroscopy*, Munich, Germany (Mar. 2019).
- 8 ISOLDE Workshop and Users meeting 2019, *Exploring the antimony ($Z = 51$) isotopic chain with laser spectroscopy*, Geneva, Switzerland (Dec. 2019).

Poster Presentations and Seminars

- 1 Mazurian Lakes Conference on Physics, “A novel laser spectroscopy technique for observing the most exotic nuclei”, in, Piaski, Poland (Sept. 2023).
- 2 ISOLDE Physics Group Seminar, “From first principles to nuclear ground-state properties of the Sb ($Z = 51$) isotopic chain”, in, Geneva, Switzerland (Jan. 2021).
- 3 ISOLDE Physics Group Seminar, “Laser Spectroscopy of Antimony Isotopes and the Design of a Cryogenic Paul Trap”, in, Geneva, Switzerland (Nov. 2021).
- 4 SMI Seminar on fundamental interactions and symmetries, “MIRALCS – A novel laser spectroscopy technique to explore the most exotic nuclides”, in, Vienna, Austria (June 2021).
- 5 Vth Topical Workshop on Modern Aspects in Nuclear Structure, “A cryogenic linear Paul trap for the Multi Ion Reflection Apparatus for Collinear Laser Spectroscopy”, in, Bormio, Italy (Feb. 2020).
- 6 International Conference Merger of the Poznan Meeting on Lasers and Trapping Devices in Atomic Nuclei Research and the International Conference on Laser Probing (PLATAN), “A cryogenic linear Paul trap for the Multi Ion Reflection Apparatus for Collinear Laser Spectroscopy”, in, Mainz, Germany (May 2019).

- 7 ISOLDE Physics Group Seminar, “A Cryogenic Paul Trap for MIRACLS’ 30 keV MR-ToF”, in, Geneva, Switzerland (Apr. 2019).
- 8 Winter school on Physics with Trapped Charged Particles, “MIRACLS - The Multi Ion Reflection Apparatus for Collinear Laser Spectroscopy”, in, Les Houches, France (Jan. 2018).
- 9 ISOLDE Physics Group Seminar, “ Proton therapy simulations at MedAustron”, in, Geneva, Switzerland (May 2017).
- 10 ISOLDE Workshop and Users meeting 2017, “MIRACLS - The Multi Ion Reflection Apparatus for Collinear Laser Spectroscopy”, in, Geneva, Switzerland (Dec. 2017).

Activities

- Sports  Badminton, ping-pong, climbing, hiking, running, cycling, swimming
- Music  Playing drums and guitar
- Misc  Playing card and board games, reading fictional and non-fictional books