Timothée Audinet

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Current Position

Sorbonne Université, France *Sept. 2022 - Today*
Laboratoire de Chimie Théorique, LCT, UMR 7616
Ph.D. Project: Development of relativistic methods based on effective QED
Ph.D. Supervisor: Julien Toulouse

By investigating one-dimensional model of relativistic effective quantum electrodynamics we hope to gain insights that would allow us to offer a way to compute QED quantities in a finite basis set in 3D.

Education

École Normale Supérieure de Lyon, France *2019 - 2020 and 2021-2022*
Master degree, Molecular Simulation in Physics and Chemistry, *AtoSim* Average grade: 16.2/20
Department of Matter Sciences

École Normale Supérieure de Lyon, France *2020 - 2021*
Preparation to the *agrégation* exam
Received 2/38

École Normale Supérieure de Lyon, France *2018 - 2019*
Degree in Chemistry Average grade: 14.6/20
Department of Matter Sciences

Blaise Pascal High School, Clermont-Ferrand, France *2015 - 2018*
Preparatory Classes for the Grandes Écoles

Technical Strengths

Mathematical Tools	Functional Analysis, Green functions, Topology...
Modeling and Analysis	Bash, Python, Mathematica
Languages	Native French, English C1

Work Experience

Spectral function and three-body Green functions Supervisor: Arjan Berger
· LCPQ, Université Paul Sabatier, Toulouse *May-July 2020*
· 4th year (Master 1) internship

One-dimensional model for Relativistic Quantum Chemistry Supervisor: Julien Toulouse
· LCT, Sorbonne Université, Paris *Feb.-July 2022*
· 5th year (Master 2) internship

Teachings

Mathematics and Mathematica for Chemists 2nd year
· Sorbonne Université, Paris *2022-2025*

General Chemistry 2nd year

· Sorbonne Université, Paris *2022-2025*

Introduction to Python for Chemists 3rd year

· Sorbonne Université, Paris *2023-2024*

Summer Schools followed

- European summerschool in quantum chemistry, (ESQC), 11-24/09/2022, Palermo, Sicily, Italy.
- International summer School in electronic structure Theory: electron correlation in Physics and Chemistry (ISTPC), 19/06-2/07/2022, Centre Paul Langevin, Aussois, Savoie, France.
- 4th, 5th, 6th, and 7th edition of the Mini-school on mathematics for theoretical chemistry and physics, May-June 2022/2023/2024/2025, Sorbonne Université, Paris, France.

Presentations

- **Invited Talk** 14/11/2024: **T. Audinet**, J. Toulouse, *Development of a relativistic one-dimensional model including quantum electrodynamics effects*, Laboratoire de Chimie et Physique Quantiques, Université Paul Sabatier, Toulouse, France.
- **Oral Presentation** 26/06/2024: **T. Audinet**, J. Toulouse, *One-dimensional model for relativistic quantum chemistry*, Rencontres ThéMoSiA-RCTF2024, 24-28 June 2024, Rouen.
- **Oral Presentation** 11/01/2024: **T. Audinet**, J. Toulouse, *One-dimensional model with delta-type interactions: Diracs equation with QED interactions*, Model Systems in Quantum Mechanics (MSQM), 11-12 January 2024, Toulouse.
- **Oral Presentation** 18/10/2023: **T. Audinet**, J. Toulouse, *One-dimensional model for relativistic quantum chemistry*, Journées Théorie, Modélisation et Simulation (JTMS) 2023, 17-18 Octobre 2023, Strasbourg.
- **Oral Presentation** 10/03/2023: **T. Audinet**, J. Toulouse, *One-dimensional model for relativistic quantum chemistry*, EMC2 Seminar, Sorbonne Université, Paris, France.
- **T. Audinet**, U. Morellini, J. Toulouse, *One-dimensional model for relativistic density-functional theory*, 14th International Conference on Relativistic Effects in Heavy-Element Chemistry and Physics, 7-11 October 2024, Amersfoort, Netherlands.
- **T. Audinet**, J. Toulouse, *One-dimensional model for relativistic density-functional theory*, 20th International Conference on Density Functional Theory and its Applications, 25-30 August 2024, Paris, France.
- **T. Audinet**, J. Toulouse, *One-dimensional model for relativistic quantum chemistry*, 17th International Congress of Quantum Chemistry, ICQC, 26 June - 1 July 2023, Bratislava, Slovakia.
- **T. Audinet**, J. Toulouse, *One-dimensional model for relativistic quantum chemistry*, Journée de l'ED 388, 15 June 2023, Chimie ParisTech, Paris, France.
- **T. Audinet**, J. Toulouse, *One-dimensional model for relativistic quantum chemistry*, Workshop on Excited State Methods, 4-6 April 2023, Toulouse, France.
- **T. Audinet**, J. Toulouse, *One-dimensional model for relativistic quantum chemistry*, European summerschool in quantum chemistry, 11-24 September 2022, Palermo, Sicily, Italy.
- **T. Audinet**, J. Toulouse, *One-dimensional model for relativistic quantum chemistry*, 3rd edition of the International summer School in electronic structure Theory: electron correlation in Physics and Chemistry (ISTPC), 19 June - 2 July 2022, Centre Paul Langevin, Aussois, Savoie, France.

Scientific publications

1. *Vacuum polarization in a one-dimensional effective quantum-electrodynamics model*, **T. Audinet**, U. Morellini, A. Levitt and J. Toulouse, J. Phys. A, **58**, 125304 (2025) — ArXiv,
2. *Effective quantum electrodynamics: One-dimensional model of the relativistic hydrogen-like atom*, **T. Audinet** and J. Toulouse, J. Chem. Phys., **158**, 244108 (2023) — ArXiv
3. *Photoemission spectral functions from the three-body Green's function*, G. Riva, **T. Audinet**, M. Vladaj, P. Romaniello, and J. Arjan Berger, SciPost Phys., **12**, 093 (2021) — ArXiv