Linkedin
Google scholar
Github

Jan Olle

AI for Science Researcher

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Date of birth: 12 Sept 1994
Nationality: Spain

IMPACT

10+ scientific publications with **200**+ citations, **3** contributed talks, **8** posters (1 **ICML** workshop **spotlight**), **8** invited seminars and **2** awards.

INTERESTS

Artificial intelligence, self-supervised learning, reinforcement learning, scientific computing, meta learning, transformers, planning, large models, agentic models, chain of thought.

EDUCATION AND RESEARCH EXPERIENCE

Postdoctoral Researcher, Max Planck Institute for the Science of Light; Germany — 06.2022–Present

Member of the theory division and of the Munich Quantum Valley — Supervisor: Prof. Dr. Florian Marquardt.

- Training a **generative**, **transformer**-based model with a **synthetically generated dataset** of quantum circuits, enabling on-demand generation of custom error correction codes (underway).
- **Lead researcher** responsible for developing QDX, a **JAX**-based (Python) open-source **reinforcement learning** framework for the **automated discovery of quantum error correction strategies**.
- QDX features a **GPU quantum circuit simulator** that is **100x faster** than the state of the art and enhances **reinforcement learning** scalability to quantum error correction code discovery by **10x**.
- **Core contributor** in a project that **extends reinforcement learning objectives to arbitrary functions of rewards** rather than the cumulative sum.
- **Core contributor** in the first **AI-discovered** and experimentally realizable **fault-tolerant quantum circuit**.
- Experience in developing **differential programming physics simulators** in Python.

5 *publications*. 2 *NeurIPS and* 1 *ICML workshop* ***(spotlight)*** *contributions.*

Ph.D. Physics (Cum Laude), Autonomous University of Barcelona; Spain — 07.2018–06.2022

Theory division. Supervisor: Prof. Dr. Oriol Pujolas.

- Developed Python **numerical solvers of non-linear partial differential equations** applied to dark matter
- Invented a **new computational technique** to estimate the lifetime of dark matter states that would have otherwise taken **thousands of years to simulate.**

4 publications.

Visiting Researcher, Institute for Basic Science; South Korea — 09.2021–12.2021

Centre for Theoretical Physics of Complex Systems. Host: Dr. Dario Rosa.

2 *publications.*

M.Sc. Theoretical Physics (Distinction), University of Oxford; United Kingdom — 2016–2017

B.Sc. Physics, Autonomous University of Barcelona; Spain — 2012–2016

Research intern, ALBA Synchrotron; Spain — 01.2015—06.2015

- **Core developer** of BpmLab, a **finite element**-based software that simulates the electrode response to the passage of particle beams in accelerators of arbitrary geometry.
- BpmLab is now **routinely used in accelerator facilities** across the world.

1 publication.

AWARDS

Grant BES-2017-080511 from MINECO (Spain).

SIlver medal at The University Physics Competition, 2015.

Updated: July 30th, 2024.