Manon Johansson Chatel

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MSc student in quantum physics and Student Research Assistant at the Niels Bohr Institute, with a focus on gravitational physics, computational modelling, and applied mathematics. Alongside my research, I have three years of experience in model risk management at Danske Bank, where I validate quantitative models and turn complex, under-defined problems into structured and defensible analyses. I am particularly motivated by research and technologies connected to space, fundamental physics, and deep-tech innovation, and I am broadening my practical exposure through my involvement with Copenhagen Suborbitals.

Work Experience

Student Research Assistant Copenhagen, Denmark
University of Copenhagen, Niels Bohr Institute – Center of Gravity August 2026 – Present

- Conduct research with Prof. Vitor Cardoso in gravitational-wave physics, focusing on gravitational mode mixing and higher-harmonic generation arising from interactions between gravitational and electromagnetic fields.
- Perform analytical calculations and develop numerical simulations to investigate nonlinear effects in general relativity.
- Contribute to research forming the basis of my master's thesis in theoretical physics.

Business Analyst Associate Copenhagen, Denmark
Danske Bank – Model Risk Management May 2025 – Present

- Promoted into a graduate-level analyst role while completing my bachelor's degree.
- Validate quantitative models under regulatory frameworks, assessing assumptions, uncertainty sources, and model robustness.
- Lead independent analytical and governance tasks with under-defined problem statements, providing structured and traceable assessments for management use.
- Develop Python-based analytical tools and automation supporting model review processes.

Student Business Analyst Copenhagen, Denmark *Danske Bank – Model Risk Management* August 2023 – May 2025

- Conducted methodological reviews, uncertainty assessments, and governance checks across quantitative models used in multiple business areas.
- Supported model validation and regulatory documentation through independent analysis, assumption testing, and structured review of model limitations.

Model Risk Intern Copenhagen, Denmark
Danske Bank – Model Risk Management February 2023 – April 2023

- Delivered a cross-business-unit system for model risk assessment that was adopted by the organisation.
- Designed a unified evaluation method integrating policy exemptions and regulatory criteria.
- Received the highest grade from the Niels Bohr Institute for the implemented internship project; a permanent student role was subsequently created to hire me.

Education

MSc in Quantum Physics Copenhagen, Denmark
University of Copenhagen, Niels Bohr Institute Expected Graduation: 2027
Specialisation in High-Energy Theory and Particle Astrophysics, with research in gravitational physics at the Center of Gravity.

BSc in Physics Copenhagen, Denmark
University of Copenhagen, Niels Bohr Institute Graduated: 2025
Additional coursework in mathematics, including measure theory, applied statistics, analytical mechanics, and mathematical modelling.

Research, Projects & Selected Engagement

- **Gravitational Physics Research Project, Center of Gravity (2025–2026):** Investigated scalar perturbations sourced by a small body orbiting a white-hole spacetime using analytical and numerical methods; awarded the highest Danish grade, 12.
- **DigiQ-Funded Observational Internship, Laboratoire Kastler Brossel, Paris (2026):** Completed an observational internship in quantum optomechanics and precision measurement, gaining exposure to homodyne detection, optical cavities, and experimental quantum technologies.
- **Copenhagen Suborbitals (2026–Present):** Contribute to a volunteer rocketry project involving control systems, pressure testing, numerical modelling, and propulsion-related development.
- **European Space Conference, Brussels (2026):** Attended as a sponsored student participant, engaging with European space policy, industry, startups, and institutional actors.
- **Venture Capital Explorer Programme (2025):** Selected as one of 12 participants for a programme delivered by UCPH Lighthouse, Accelerace, and the BioInnovation Institute on evaluating early-stage science-based ventures.
- **Bachelor's Project in Econophysics (2025):** Modelled stochastic price processes using geometric Brownian motion and mean-reverting dynamics to determine optimal decision thresholds under uncertainty, validating numerical results against analytical solutions.
- **Astrophysics Extended Essay, IB Diploma (2020):** Conducted an independent research project on the Milky Way rotation curve while still in high school. Through collaboration with Chalmers University of Technology, I was granted access to a radio telescope to collect observational data, which I then processed and analysed to investigate the galaxy's rotational dynamics.
- **ESA Citizens' Debate (2016):** Selected as one of 100 Swedish participants in ESA's Europe-wide citizens' debate.

Technical Skills

- **Programming & Scientific Computing:** Python (NumPy, SciPy, Pandas, Matplotlib, SymPy), Jupyter Notebooks, LaTeX, VS Code, Git/GitHub, basic multiprocessing.
- **Numerical Modelling & Simulation:** ODEs, PDEs, finite-difference methods, Runge–Kutta methods, Monte Carlo simulations, stochastic processes, perturbation theory.
- **Data Analysis & Model Validation:** Data cleaning and preprocessing, time-series analysis, curve fitting and regression, uncertainty analysis, sensitivity analysis, assumption testing, model validation.

Languages

- Swedish (native), English (fluent), French (intermediate), Spanish (intermediate), Danish (intermediate).

Academic and professional references available upon request.