Dr. Alexis **Gomel**

Curriculum Vitae

Personal

Nationality	Spanish and Argentinian	Birth Date	December 14th, 1989
Residence	Munich, Germany.	Birth Place	Buenos Aires, Argentina.
Email	alexis.gomel@gmail.com	LinkedIn	alexis-gomel-95484278
Website	alxgom.github.io/alxgom/	Kaggle	alexisgomel
Publications	scholar.google.de/citations?user=XgG56aYAAAAJ&hl		

I have over six years of experience in physics research and education, where I applied data analysis techniques to solve scientific problems. As a postdoctoral researcher at the University of Reading and during my PhD in physics at the University of Geneva, I developed strong skills in numerical and experimental data analysis. I have over six years of experience in physics research and education, where I applied data analysis techniques to solve scientific problems. As a postdoctoral researcher at the University of Reading and during my PhD in physics at the University of Geneva, I developed strong skills in numerical and experimental data analysis.
I have worked extensively with complex data sets, preparing me well for real world data science projects with data-driven insights. My strengths include problem-solving, creativity, communication, and teamwork. I enjoy tackling new challenges and learning new techniques, especially in data science and machine learning.

Skills

- Python ●●● +8 yrs Matlab ●●● +7 yrs SQL ●◎○ (new) Git ●●○ +5 yrs Latex ●●● +6 yrs
- Python packages: Pandas, Numpy, Scipy, Plotly, Matplotlib, Poetry
- Machine learning: Tensorflow, Keras, Scikit Learn

Data Science	Data Analysis, Data Storytelling, Data Visualizations, Statistics, Mathematical Modelling, Numerical Simulations Time Series Analysis.	Mathematics	Regressions, Fourier analysis, numerical integration, extrapolation, interpolation, wavelet analysis, stochastic simulations, nonlinear differential equations, linear algebra, modelling.
Statistics	Ensemble statistics, uncertainty estimation, PCA, k-means, correlation, mutual information, unbiased statistical moments.	Physics	Non-linear dynamics, Laser physics, Fluid Mechanics, Statistical Physics

Transferable skills

- Communication: Experience talking to a wide audience and large numbers of people in science exhibitions and to peers in several workshops and conferences. Presentations in English and Spanish.
- Mentoring: Experience teaching several courses in school, and university, having taught to more than 200 students. Developing my own course resources and evaluations.
- Project management: Managing my research projects and helping with the formation of master students.
- Drive and motivation: Keen on taking risks to grow, having lived in several countries and learning the languages while living there. I also like to get involved in my communities, be it in the workplace or in my hobbies, as exampled by currently helping organize events and teach classes in the local swing dance scene.

Work experience

April 2023 - February 2024 **Mathematics Postdoctoral Researcher**, *University of Reading*, **Reading, United Kingdom**

Conducted advanced research on tipping points in dynamical systems with a focus on climate models. Developed and analyzed stochastic systems, non-adiabatic forced systems, and early warning signals of abrupt transitions from data properties. Applied mathematical and statistical techniques to model and interpret complex climate data.

- **Research & Analysis**: Designed and implemented models to predict tipping points in climate systems using stochastic and nonlinear methodologies.
- **Data Science**: Utilized advanced data science techniques to analyze large datasets, extract meaningful insights, and visualize data trends related to climate change.
- **Programming**: Developed scripts and algorithms in Python and Matlab for data analysis and visualization. Created tools to simulate climate scenarios and assess their impact.
- **Collaboration**: Worked with interdisciplinary teams to integrate climate data with physical models, improving the accuracy of climate predictions.
- *Skills*: Data Science, Climate Modelling, Stochastic Modelling, Nonlinear Systems, Data Visualization, Python, Matlab.

May 2018 - February 2023 **Researcher**, *University of Geneva*, **Geneva, Switzerland**

Developed theoretical models for early warnings in dynamical systems and multi-scale expansion approximation for gravity waves. Conducted numerical simulations of stochastic differential equations and partial differential equations to explore ideas and validate experimental data.

- **Research & Analysis**: Designed and implemented models for early warning signals in dynamical systems and multi-scale expansions for gravity waves. Worked with image processing, developed models with dimensional reduction.
- **Data Science**: Applied advanced data science techniques with FFT, change of system of reference, and other tools to format, analyze, and interpret data from simulations and experiments as the subjects required. Performed statistical descriptive analysis developing KPI.
- **Programming**: Developed scripts and algorithms in Python and MATLAB for numerical simulations and data analysis.
- **Collaboration**: Collaborated with interdisciplinary teams, integrating diverse perspectives and contributing to collaborative research efforts.
- **Presentations & Publications**: Presented research at conferences and to peers, and published findings in scientific journals, enhancing communication skills.
- *Skills*: Data science, data analysis, image processing, theoretical modelling, numerical simulations, scientific communication, collaboration, Python, Matlab.

May 2018 - December 2022 **A1 Assistant**, *University of Geneva*, **Geneva, Switzerland**

Assistant for 1st year laboratory courses, and in charge of teaching and making exercises for the practical work for the nonlinear dynamics course.

- *Skills:* Explaining and developing experiments with educational purposes. Developing exercises, numerical simulations in Python and Matlab and teaching live and on-line for the nonlinear dynamics course.

February 2016 - April 2016 **Undergraduate Teaching assistant**, *University of Buenos Aires*, **Buenos Aires, Argentina**

Teaching assistant at the university for an introductory course to thermodynamics and quantum mechanics.

- *Skills:* Communication, teaching, crafting educational materials.

July 2015 - February 2016 **Math High school replacement teacher**, *Boston High School & River Plate High School*, **Buenos Aires, Argentina**

Substitute math teacher at two different high schools. Where I also developed the class materials and exams.

- *Skills:* Communication, teaching, crafting educational materials.

Education

05/2018 - 02/2023 **PhD in Physical sciences**, *University of Geneva*, *G.P.A:* 10/10,
Subject: Nonlinearities in dynamical systems.
Supervisors: Jerôme kasparian, Maura Brunetti

03/2008 - 04/2017 **M.S Physics**, *Universidad de Buenos Aires*, *G.P.A:* 8.89/10,
Subject: Rogue waves en lasers modulados en fase (Rogue waves in phase modulated lasers).
Supervisors: Jorge Tredice, Pablo Mininni

English Proficient (C2) Spanish Native
French Intermediate (B1) German Intermediate (B1)

Selected Publications

[1] Alexis Gomel, Amin Chabchoub, Maura Brunetti, Stefano Trillo, Jérôme Kasparian, and Andrea Armaroli. Stabilization of Unsteady Nonlinear Waves by Phase-Space Manipulation. *Physical Review Letters*, 126(17):174501, mar 2021.

[2] Alexis Gomel, Jean Marc Boyer, Cyrille Metayer, and Jorge R. Tredicce. Extreme Events in Lasers with Modulation of the Field Polarization. *Advances in Condensed Matter Physics*, 2019, 2019.

[3] Alexis Gomel, Corentin Montessuit, Andrea Armaroli, Debbie Eeltink, Amin Chabchoub, Jérôme Kasparian, and Maura Brunetti. Mean flow modeling in high-order nonlinear Schrödinger equations. *Physics of Fluids*, 35(8):087128, 08 2023.

[4] Alexis Gomel, Debbie Eeltink, Geoffrey Gaulier, Jerome Kasparian, and Maura Brunetti. Two statistical regimes in the transition to filamentation. *Optics Express*, jan 2023.

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