

Elie Attal

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EDUCATION

- 2024 – present **PhD in applied mathematics**
CMAP, École Polytechnique
Advisors: E. Abi Jaber and M. Rosenbaum.
Thesis: Interacting agents, jump processes and Volterra processes.
- 2023 – 2024 **M2 Probability and Finance**
Sorbonne Université / École Polytechnique
- 2020 – 2023 **Ingénieur polytechnicien master's degree**
École Polytechnique
Master's degree in applied mathematics.

PROFESSIONAL EXPERIENCE

- 4 months, 2026 **Quantitative research intern**
Bloomberg L.P., New York
Developed numerical methods for path-dependent option pricing under rough volatility models. Carried out as part of the Bloomberg Quantitative Finance PhD Fellowship.
- 6 months, 2024 **Quantitative research intern**
Qube Research & Technologies, Paris
Studied the limiting eigenvector overlaps between large random matrices and their submatrices. Published as two papers in *Journal of Physics A: Mathematical and Theoretical*.
- 5 months, 2023 **Quantitative research intern**
DRW Holdings, London
Designed a quoting model for RFQ platforms combining machine learning and probability.
- 3 months, 2022 **Quantitative research intern**
ITO33, Paris
Extended the Black–Scholes framework to price convertible bonds under takeover risk. Implemented the model in C++ in the company's pricing software.

AWARDS

- 2026 **QRT PhD Prize**
For the talk *Affine structure of the Brownian signature* at the London–Paris Bachelier Workshop on Mathematical Finance.
- 2025 **Bloomberg Quantitative Finance PhD Fellowship**

PUBLICATIONS

- **Simulating integrated Volterra square-root processes and Volterra Heston models via inverse Gaussian**
with E. Abi Jaber. *Finance and Stochastics*, to appear, 2026. arXiv:2504.19885
- **From hyper roughness to jumps as $H \rightarrow -1/2$**
with E. Abi Jaber and M. Rosenbaum. *The Annals of Applied Probability* 36(4), 3635–3660, 2026. arXiv:2503.16985

- **Eigenvector overlaps of random covariance matrices and their submatrices**
with R. Allez. *Journal of Physics A: Mathematical and Theoretical* 58, 205003, 2025. arXiv:2501.08768
- **Interlacing eigenvectors of large Gaussian matrices**
with R. Allez. *Journal of Physics A: Mathematical and Theoretical* 58, 045003, 2025. arXiv:2409.17086

PREPRINTS

- **Stochastic control with signatures via Riccati equations on the tensor algebra**
with E. Abi Jaber and D. Sotnikov. 2026. arXiv:2607.03986
- **Affine structure of the Brownian signature**
with E. Abi Jaber and D. Sotnikov. 2026. arXiv:2606.29622
- **Volterra clocks and their pure-jump limits: hitting times of curved boundaries**
with E. Abi Jaber and A. Søjmark. 2026. arXiv:2605.29073
- **Efficient simulation of Hawkes processes using their affine Volterra structure**
with E. Abi Jaber and D. Sotnikov. 2025. arXiv:2511.13554

TALKS

Conferences and workshops

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|------------|---|
| Sept. 2026 | London–Paris Bachelier Workshop on Mathematical Finance, Paris (<i>invited</i>)
<i>Affine structure of the Brownian signature — QRT PhD Prize</i> |
| Sept. 2026 | International Conference on Computational Finance, Oxford
<i>Simulating integrated Volterra square-root processes and Volterra Heston models via inverse Gaussian</i> |
| Apr. 2026 | Stochastic Control and Games for Risk & Regulation, Hammamet
<i>Simulating affine Volterra processes via inverse Gaussian</i> |
| Jan. 2026 | 18th Bachelier Colloquium on Financial Mathematics and Stochastic Calculus, Métabief
<i>From hyper-roughness to jumps as $H \rightarrow -1/2$: the affine case and beyond</i> |
| Sept. 2025 | Stochastics & Computational Finance, Lisbon
<i>Simulating affine Volterra processes via inverse Gaussian</i> |
| July 2025 | Vienna Congress on Mathematical Finance, Vienna
<i>From hyper roughness to jumps as H goes to $-1/2$</i> |

Seminars

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| Dec. 2025 | Seminar of the CMAP MathsFi group, École Polytechnique
<i>Simulating affine Volterra processes via inverse Gaussian: the iVi schemes</i> |
| May 2025 | Local Seminar, Vega Institute, Moscow (online)
<i>From hyper roughness to jumps as $H \rightarrow -1/2$</i> |
| Mar. 2025 | Bachelier Seminar (PhD session), IHP, Paris
<i>From hyper roughness to jumps as $H \rightarrow -1/2$</i> |
| Mar. 2025 | Seminar of the CMAP MathsFi group, École Polytechnique
<i>From hyper roughness to jumps as $H \rightarrow -1/2$</i> |

TEACHING

2026 – 2027	École Polytechnique Supervision of M1 group projects: <i>Stability of eigenvectors of covariance matrices in finance; Heat equation and Cole–Hopf transform: entire series representations and numerical schemes</i>
2025 – 2026	École Polytechnique Markov processes and applications (M1), tutorial classes Probability (L3), tutoring ENSAE Supervision of an M1 group project: <i>Toward a new stochastic model for integrated variance: insights from SPX and VIX</i>
2024 – 2025	École Polytechnique Markov processes and applications (M1), tutorial classes Probability (L3), tutoring Supervision of an M1 internship: <i>Numerical schemes for Riccati–Volterra equations</i>

SKILLS

Languages	French (native), English (fluent), Spanish (conversational)
Programming	Python (numpy, scipy, pandas, scikit-learn), SQL, Git, LaTeX, Power BI