Postdoc Position beginning ASAP for a talented PhD with expertise in Mathematical Finance

The Quantitative Finance Group of Université Paris Cité invites applications from talented PhDs with expertise in Mathematical Finance, for a 2 years postdoctoral research position starting ASAP.
Location: LPSM, Sophie Germain building/Université Paris Cité, 8 Place Aurélie Nemours, 75013 Paris

Gross monthly salary: 3.500€ without teaching OR 3.700€ with no more than 50 hours/year teaching.

Research fields: financial pricing and hedging theory; risk measures, counterparty credit risk, XVA analysis; machine learning techniques, uncertainty quantification, model risk; and related mathematical topics in the fields of BSDEs/PDEs and numerical probabilities.

One possible topic (indicative: the project research of candidates will be discussed in an interview depending on their background and motivations): Markovian ABSDEs.
Anticipated BSDEs (ABSDEs) were introduced in (Peng et al. 2009) as BSDEs where the coefficient entails a dependence with respect to the solution in the future. This was done in an abstract semimartingale setup. The study of these equations in Markovian framework, however, remains an open problem. Recently several works including (Chassagneux et al. 2014, Cosso et al. 2020), have studied this type of PDE in different contexts. The establishment of the corresponding Feynman-Kac formula and the study of associated numerical schemes will thus be the first objectives of this project. Implementation by machine learning techniques and financial applications to XVA computations (Crépey et al.. 2020) will then be considered.

References:
Chassagneux J.-F., D. Crisan, and F. Delarue (2014). A probabilistic approach to classical solutions of the master equation for large population equilibria. arXiv :1411.3009.

Cosso A., F. Gozzi, I. Kharroubi, H. Pham, and M. Rosestolato (2020). Optimal control of path dependent mckean-vlasov sdes in infinite dimension. arXiv :2012.14772.

Crépey S., W. Sabbagh and S. Song. When capital is a funding source: the anticipated backward stochastic differential equations of X-value adjustments. SIAM Journal on Financial Mathematics 11(1), 99–130, 2020.

Peng S. and Z. Yang. Anticipated backward stochastic differential equations. The Annals of Probability 37.3 (2009): 877-902.

Scientific environment: The Emile Borel heritage Laboratoire de Probabilités, Statistique et Modélisation, more than 200 researchers, faculty members and PhD/postdoctoral students in the heart of Paris (sites Sophie Germain and Jussieu), covering together the whole spectrum of modern probabilities and statistics in six teams, all at the highest international level. The postdoc can develop multiple collaborations with confirmed and young researchers at LPSM team "Financial and Actuarial Mathematics, Numerical Probability".

Conditions to apply: PhD (or defense by the Spring) in probability, statistics and computer science, with publication in the top academic journals in the fields.

Prerequisites:

- ***Theoretical background*****:** Probability and, if possible, Statistics.
- ***Domain knowledge*****:** Mathematical finance and, if possible, machine learning.
- ***Languages*****:** Fluent English (spoken and written). French welcome but not mandatory.

Miscellaneous: The position is funded by the Chair Capital Markets Tomorrow: Modeling and Computational Issues. Collaborative research with younger (PhD) students is encouraged. No mandatory teaching but teaching opportunities at all (including master) level.

Applications: Until completion of the position
Please send **ASAP** your CV and cover letter to Stéphane Crépey by mail to stephane.crepey@lpsm.paris

March 2023