

Postdoctoral Position in Microfluidics – Quantomatic Project

We are looking for postdoctoral candidates with a background in (droplet) microfluidics.

30 years after the discovery of Quantum Dots (QDs), applications of these luminescent nanocrystals have bloomed, especially as light display devices. QD-based light-emitting diodes are the main driving force of a market that is expected to reach 3 billion US\$ by 2018. Importantly, they rely on QDs of tightly specified optical properties. Hence, there is a growing demand towards massive production of high quality QDs. However, conventional batch-wise syntheses suffer from low throughput and significant batch-to-batch variability, in addition to being tedious and unsafe. Moreover, these protocols involve toxic precursors whose use is restricted by European laws, as well as pricey solvents. As a result, QD manufacturing costs are high, which hinders the development of large scale applications. To lower them, there is a need to switch to more environmentally benign materials as well as to significantly upscale the manufacturing process. However, to date, scaling up syntheses of high quality, environmentally benign QDs remains an unresolved issue. This stems from the fact that QD synthesis occurs under exquisite kinetic control, rendering the overall process difficult to tame. So far, up-scaling and switching to non-toxic materials have always come at the price of quality loss.

The QUANTOMATIC project aims at tackling these issues through building an innovative reactor designed for the high throughput synthesis of high quality, environmentally friendly QDs according to user-set properties. Our approach will yield a reliable, user-friendly and cost-efficient reactor for QD synthesis. This achievement should stand as a milestone regarding the way nanocrystals are produced and as such holds a significant market potential.

The project will take place at the MSC (Matter and Complex Systems) Laboratory of Paris Diderot University. It will be coordinated by Pascal Hersen, physicist and Gaëlle Charron, chemist. MSC is a physics laboratory devoted to understanding complex systems through multidisciplinary approaches. It integrates scientists from various backgrounds, including biologists and chemists. The lab has a renowned expertise in nanoparticles and colloidal systems, as well as in numerical simulation of complex processes and automated piloting of biological systems. The team provides on-site access to all instruments, skills and facilities needed to carry the project.

We are seeking an enthusiastic, resourceful applicant having a strong background and experience in (droplets) microfluidics. Additional skills in programming, instrumentation and automation are welcomed. The position is funded by the SATT IDF-Innov.

Starting date: as soon as possible | **Deadline for application:** open until filled

To apply please send a motivation letter, a CV, and emails of two references.

Contact:

Pascal Hersen | Email: pascal.hersen@univ-paris-diderot.fr | Web: <http://lab513.fr/labr/>
Gaëlle Charron | Email : gaelle.charron@univ-paris-diderot.fr