**Marie Curie PhD position in Milano**

**PhD in Physics at Politecnico di Milano**

- Submission deadline: *mid-March*; Start date: May 2017
- 3 year PhD, **€3000/month** net salary
- Participation in dynamic 14-member European team
- Supervisor Dr. Shane Eaton [shane.eaton@gmail.com](mailto:shane.eaton@gmail.com)
- **Requirements**: Related Masters degree in past 4 years, lived outside of Italy for more than 2 of the last 3 years

---

**Femtosecond laser nanofabrication**

- **Focused femtosecond laser** pulses are **nonlinearly absorbed** in transparent materials due to their high peak intensity
- **3D**: Highly localized modification only at the focus, enabling **3D microfabrication**
- **Modalites**: buried optical waveguides, surface laser ablation, 3D printing of microstructures in photoresists

---

**PHOTORAIN project**: Femtosecond laser writing of microchannels in glass for clean energy

---

Photocatalysis **splits water** using sunlight, directly producing a **solar fuel** by storing solar energy in the chemical bonds of H₂ and O₂, which can be used to power next generation fuel cells.

**Femtosecond laser microfabrication** will be used to form buried and surface microchannels in glass, to engineer **tangential laminar flows** which do not mix.

This will enable **microfluidic interfaces** with reversible organization of functional pigments into photosynthetic architectures in which vectorial photoinduced energy- and electron-transfer processes yield long-lived charged species in different **heterogeneous liquid phases**.

**Vis-adsorbing chromophores** undergo self-assembly at the two interfaces, in which antenna molecules fuel donor and acceptor electron mediators. Sensitized D* and A* then **react independently** with the **catalysts**. Splitting of the flows causes disassembly of the interfacial organization, restoring the photoactive species, enabling their **clean recycling**.