

7 June 2017, 2pm (Ingram Lecture Theatre)	<u>Ricardo Sapienza</u> <u>(King's College London)</u>	<i>The Optical Society (OSA)</i> <i>student chapter talk:</i> “Nanoscale photonic network lasers”
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With decades of proven success, lasers have become central to many technologies that are used in manufacturing, communications, medicine and entertainment. Yet laser research continues to develop new types of light sources with unique and unprecedented characteristics, that have not yet been realised with existing laser technology.

Conventional lasers are generally restricted to aligned mirrors at fixed positions and 1D geometries, resembling the original design from the '60s. Instead, random lasers are mirror-less lasing systems which use highly disordered materials to obtain laser action, and have attracted significant interest due to their structural simplicity. Here the disordered matrix folds the optical paths by multiple scattering, while optical gain provides the amplification that triggers lasing. The result is an opaque medium in which laser light is generated by flowing and scattering in a speckle-like pattern.

I will introduce photonic network lasing originated from a web-like network of subwavelength waveguides. Building on this I will show how we design and fabricate biocompatible random laser lasers that can be use as sensitive sensors for living tissue integration, opening a path between complex photonics and medicine for future health care.