

Proposal Acronym	GRANQO
Proposal Title:	Graphene based nonlinear quantum optics
Surname:	Jablan
First name(s):	Marinko
Research area:	Physics PHY
Sub-discipline of research area:	Optics and quantum optics
Category of research:	basic
[REDACTED]	[REDACTED]
Abstract:	<p>There is an on-going quest to actuate nonlinear optical properties at low power and on chip-scale devices. However current devices are bulky and suffer from small nonlinear response. In this project we wish to explore a fundamentally new approach, by using plasmon-enhanced graphene-based nonlinear quantum optics to overcome all of the current barriers. We will develop comprehensive theories of nonlinear processes in graphene, propose novel applications in the quantum regime, and collaborate with groups working to experimentally realize our ideas. Another subject that we want to address is opto-mechanics in graphene. While electronic and optical properties of graphene have witnessed a huge interest in the last few years, graphene mechanical properties are still relatively unexplored. Specifically we wish to explore the possibility to actuate, probe and control the mechanical motion of graphene by optical sources.</p>
Does this proposal possess any of the sensitive ethical issues detailed in ethical issues table?:	No