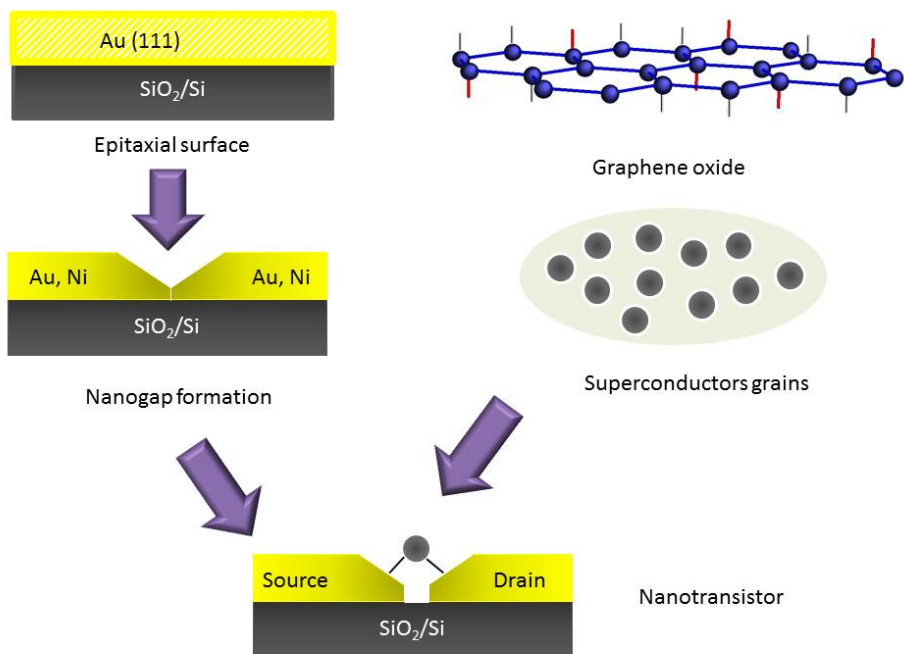


## Luis De Los Santos Valladares (University of Cambridge)



Luis (back) and Japanese collaborators

Visiting Japan as a JSPS postdoctoral fellow was a very exiting experience. I performed experiments in novel components for nanoelectronics devices at the Tokyo Institute of Technology. Magnetic surfaces and nanograins are good candidates for replacing the conventional silicon components of electronic chips. Within these, I studied superconducting nanograins, graphene oxide and nickel electrodes. The benefits of superconducting and graphene oxide electronics over semiconductor electronics are the high carriers mobility which allows ultrafast switching speed (for digital applications) and high sensitivity/response to electromagnetic phenomena over a very wide frequency spectrum (for analogue applications). Moreover, the fabrication of nickel electrodes is nowadays of interest because they enable studies of single charge and spin transfer. For instance, ferromagnetic electrodes forming a point contact could be very helpful for studying the controversial ballistic magnetoresistance (BMR) effect. These materials are promising candidates for fabricate smaller, faster and high-memory chips (see figure). The results obtained during my research in Japan have been published in five scientific articles; some of them were highlighted in specialized journals (see for instance <http://nanotechweb.org/cws/article/lab/44242> ). In all our publications, the JSPS funding was specially acknowledged. This program helped a lot in more active research interchange between the University of Cambridge (UK) and the Tokyo Institute of Technology (Japan). Furthermore, during my stay I meet new friends who were very friendly and helpful not only in, out of the working institution as well. This experience also gave me the opportunity to understand better the Japanese culture. Currently we continue doing research collaboration from which new results are coming up soon.



**Figure.** Novel components for nanotransistors