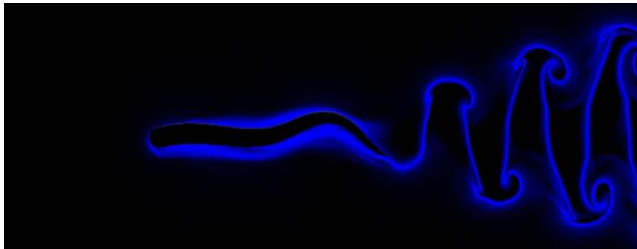


## FLUID DYNAMICS FOR HIGH PERFORMANCE SWIMMING

The study of fluid dynamics in sports presents several challenges. We offer projects on numerical simulations, instrumentation and analysis of ergonomics focused on the study of swimmers and the fluid dynamics associated with efficient swimming. The interested student would be involved in both instrumental development of methods to create images of vortices, as well as advanced numerical processes and programming to analyse the data.



In particular the interested student would be exposed to numerical methods and programming techniques with Python, laser machining for instrumentation and numerical methods for fluid dynamics.

### Further information

**(In sweden)**

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**(In Mexico)**

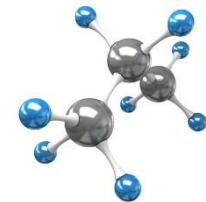
Antonio Juarez

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*Available Projects in  
Mexico*

*Linnaeus-Palme exchange*



National University of Mexico





## INTRODUCTION

An exchange program has been set up between University of Gothenburg and the National University to foster international exposure to students and teachers by means of academic exchanges, both ways, between Sweden and Mexico.

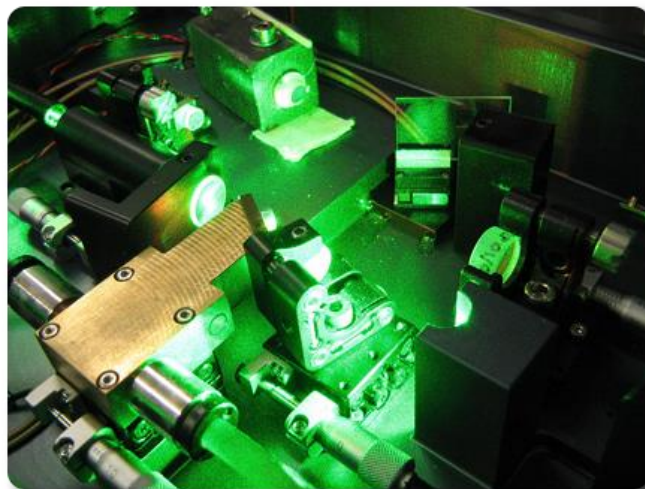
The Exchange consists in carrying out studies and research, at the master level of Swedish students at the National University and of Mexican Students at University of Gothenburg.

In this leaflet three suggested projects to be carried out by Swedish student in Mexico are presented, but also other projects could be discussed.

## OPTICAL CAVITY DETECTION OF BIOMOLECULES

We are currently developing advanced techniques for detecting biomolecules in the gas phase using several optical Cavity absorption techniques such as Cavity Ring Down and i-BBCEAS. The aim of these studies, carried out in collaboration with the school of medicine, is to develop new generation methods for non invasive monitoring and diagnosis. We are particularly interested in the early detection of diabetes.

We use Nd:YAG lasers, Quantum Cascade Lasers and high brilliance LEDs, along with cavities to perform these measurements.



## LASER-PLASMA INTERACTION



Atmospheric plasmas are currently subject of a great deal of interest, both for fundamental reasons, and for the potential applications of these in medicine and biology.

We have available master-level projects involving the study of atmospheric plasmas probed with several laser techniques (Optogalvanic, Langmuir, optical).

The interested student would get exposure in the study of fundamental properties of atmospheric micro-plasmas, Mid-Infrared lasers (QCL) and the potential applications of micro-plasmas in biomedicine.