

# **Monthly Report of Internship (8/10/2008 - 7/11/2008)**

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## **Place**

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## **Person in Charge**

Michel GENDRY (Research scientist of CNRS (Centre National de la Recherche Scientifique) at INL-ECL)

## **Research Activity**

In this month, I performed research activities described below.

(1) Molecular beam epitaxy (MBE) growth of InAs/InP quantum dots (QDs) with Riber2300

We grew InAs/InP QDs samples with different growth conditions. Michel Gendry and his colleagues have grown InAs/InP QDs with three different ways before. This time, we tried to grow the samples with another way.

(2) Reproducing a past InAs/InP QDs sample

We considered that the result of (1) was caused by a growth parameter which is different from past samples. In order to confirm the affect of the parameter, we reproduce a past InAs/InP QDs sample. This sample was also used to compare to the result of (3).

(3) MBE growth of InAs/InP QDs using a different MBE reactor (Compac21)

There is another MBE reactor in which we can grow III-V semiconductor alloys at INL-ECL. In order to grow InAs/InP QDs samples with both MBE reactors, we confirmed if we can reproduce the past sample, which was grown in Riber2300, with Compac21 under same growth conditions.

#### (4) MBE growth of localized InAs QDs

We also grew InAs QDs on a hole-patterned InP substrate. The purpose of this growth is to control the density and position of InAs QDs. QDs are formed in the holes selectively, thus it is possible to control the density and position of the QDs with this substrate. The substrates were provided by Artur Turala of Université de Sherbrooke.

#### (5) Observation of sample surface using atomic force microscopy (AFM)

We measured the surface of all samples by AFM to confirm if QDs were surely grown, and to estimate the size, height and density of QDs and distance between them. These results were returned to the next growth.

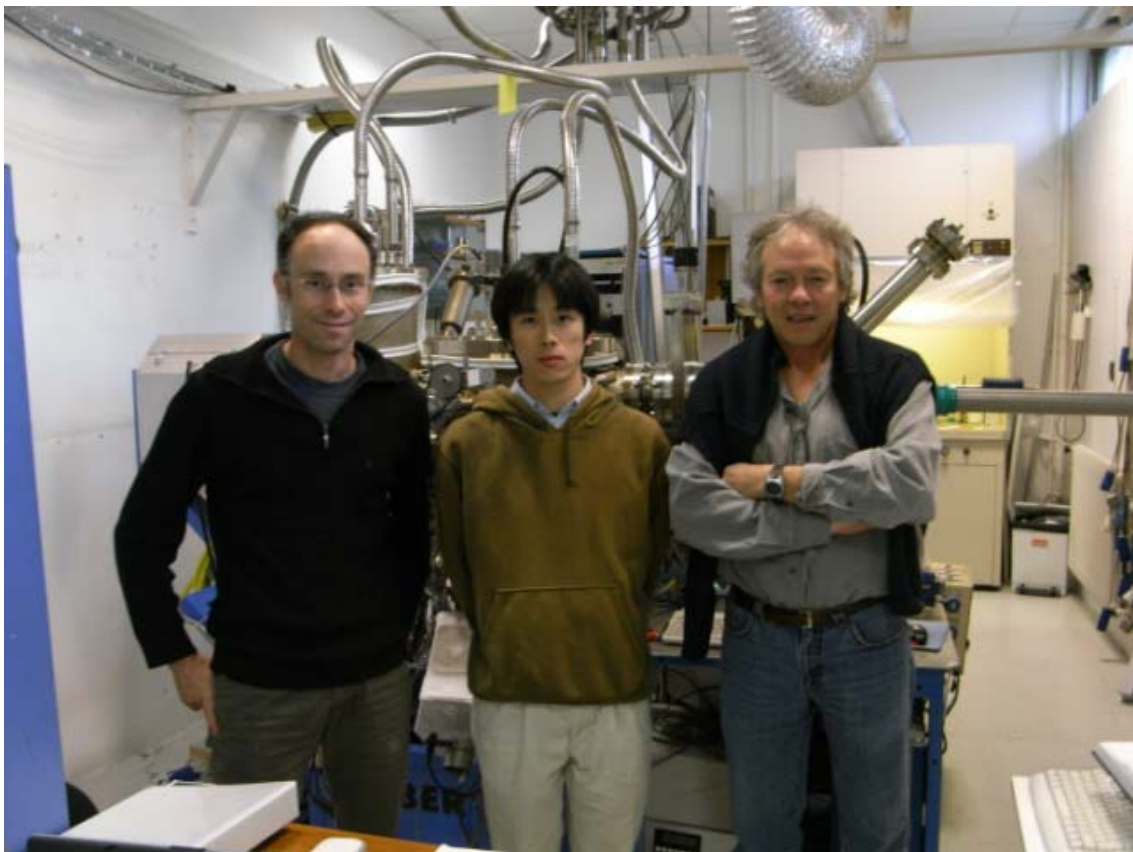


Fig. 1: Picture of Michel Gendry (right), Philippe Regreny (engineer of CNRS, left), I (center) and MBE reactor (compac21, behind).