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Paris, June 20, 2018

Report on my visit to Nepal for teaching Module III of The Nepal Algebra Project

Support for Training in Research (report)

I. Host Institution

Country: Népal

Town: Kathmandu

Name and address of the host institution (university ou equivalent): Tribhuvan University

Name and address of the host department or laboratory: Central Department of Mathematics

II. Course

Title: Nepal Algebra Project Module III

Duration: 2 weeks

Number of attendees (students, PhD students or researchers): 12

Level: MPhil

III. Teacher

Name: Waldschmidt

Firstname: Michel

Institution: Sorbonne Université, Faculté Sciences et Ingenierie, Institut Mathématique de Jussieu

IV. Mission and funding

Dates of stay: May 25, 2018 – June 15, 2018

I have been teaching module III ; supports for other modules have been given by CIMPA (STR), IMU (VLP), INDAM, RNTA

V. Opinion on the follow-up of your mission and other comments

Most of the information concerning this visit is available on the web site of NAP

http://www.rnta.eu/nap/nap-2018/module_3.php

It contains a detailed account of the 8 courses I gave, together with the subjects of the exercises I gave to the students.

I wish to add a few comments.

I started to teach on Monday, June 4, 2018; my 8th and last course was on Thursday, June 14. The lessons were each for 1 hour and half on Monday, Tuesday, Wednesday and Thursday evening. There were 12 students (often only 11). They were very well motivated, they asked a lot of questions, but for most of them they had a weak background in algebra. When I asked them for the first time what can be said of a finite group when the order is a prime number, I did not get an answer. When I asked the same question a few days later, I had to wait a little bit before they answered. Galois was able to create his theory before group theory really existed, but for Nepalese students it was a big challenge to be able to understand Galois theory before they really knew group theory. The program of module III included *The fundamental theorem of Galois theory (FTGT)*, *Examples and applications of FTGT*, *Constructions with straight-edge and compass*, *The Galois group of a polynomial*, *Solvability of equations*. I succeeded to cover it, but I did not give full proofs of FTGT and its corollaries as they are given in Milne's lecture notes which is used as a basis for this course:

J.S. Milne, Fields and Galois Theory Version 4.52 March 17, 2017.

<http://www.jmilne.org/math/CourseNotes/FT.pdf>

The basic idea of this program is that NAP will be taught by international mathematicians like me during 6 years, after which local staff of the university will teach it. This year, for the 3rd times that NAP took place, two former students, the best ones from the previous year (including one female former student), contributed by giving tutorials to the students. This is an excellent development of this program going in the right direction.

During the previous 2 years, the level of the students was higher. This year most of the students had completed their previous studies several years ago, and their level

in algebra was very poor. We hope that in the coming years the selection will enable us to have students who are better prepared.

I was supported by CIMPA under the framework of the

Support for Training in Research <https://www.cimpa.info/index.php>

I am very thankful to CIMPA for this support. Tribhuvan University contributes by giving a honorarium to the speakers.



Michel Waldschmidt.

The Nepal Algebra Project is supported by

- TU - Tribhuvan University
<http://cdmathtu.edu.np/>
- IMU- International Mathematical Union (VLP - Volunteer Lecturer Program)
<https://www.mathunion.org/cdc/lecturing/volunteer-lecturer-program>
- CIMPA - Centre International de Mathématiques Pures et Appliquées (STR - Support for Training in Research)
<https://www.cimpa.info/index.php#submenu-319>
- INDAM - Istituto Nazionale di Alta Matematica “F. Severi”
<http://www.altamatematica.it/>
- RNTA - Roman Number Theory Foundation
<http://www.rnta.eu/>

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