Report on GOleM TRAIning Course (GOMTRAIC 2019)

GOleM TRAIning Course (GOMTRAIC2019) was held at the faculty of Nuclear Sciences and Physical Engineering in the Czech Technical University in Prague, Czech Republic during March 04-08, 2019. The training course was organized in cooperation with Fusion Education Network (FUSENET) and International Atomic Energy Agency (IAEA).

Sixteen students (from undergraduate to doctoral level and ten countries) participated in the course to have hands-on experience of tokamak operation and perform experiments on the GOLEM tokamak. Following students attended the course-

Name of Participant	Affiliation	Nationality
Mikhail Gorbun	Moscow Institute of Physics and Technology	Russia
Yevhen Siusko	Kharkov Institute of Physics and Technology	Ukraine
Daniel Costa	University of Lisbon, Superior Technical Institute	Portugal
David Weldon	University of Science and Technology, China	USA
Naomi Mburu	University of Oxford, UK	USA
Soma Olasz	Budapest University of Technology and Economics	Hungary
Anej Valic	University of Ljubljana	Slovenia
Dante Loi	Cagliari university of studies	Italy
Johan Buermans	Ghent University	Belgium
Vladyslav Volkov	V.N. Karazin Kharkiv National University	Ukraine
Aleksa Blazic	University of Belgrade	Serbia
Nadiia Lisovska	Lviv Polytechnic National University, Ukraine	Ukraine
Nikola Goleš	University of Novi Sad, Serbia	Serbia
Maria Morbey	Universidade de Lisboa, Instituto Superior Técnico	Portugal
Georgii Sarancha	Moscow Institute of Physics and Technology	Russia
Samad Khani	University of Pisa, Italy	Iran

This workshop offered an interactive course on fundamental and advanced toroidal plasma physics. The course covered important aspects of experimental work on tokamaks. The course

was supervised by Vojtěch Svoboda, Jan Stöckel, Pravesh Dhyani, Mykyta Vavarin, Ondřej Grover, Kateřina Jiráková, Jaroslav Čeřovský and Petr Macha.

For the preparation of data processing, one week before the workshop, participants and task supervisors communicated to discuss the experiment plans, data analysis, related softwares and the routines used during the workshop.

On first day (March 3) of the GOMTRAIC, all the students were introduced with GOLEM tokamak, where they measured fundamental plasma parameters like loop voltage, plasma current, toroidal magnetic field and electron temperature under the supervision of Vojtěch Svoboda. Subsequently, access to the GOLEM data acquisition system and basic data analysis methods were explained by Ondřej Grover.

On the second day (March 4), a talk on tokamak physics and basic diagnostics was given by RnDr. Jan Stöckel that was followed by tasks-based lectures by other task supervisors. Afterwards, students discussed their experiment plans with their respective supervisors and performed experiments on the advanced topics as planned.

Third and Fourth day (March 5-6) were fully dedicated to the task-based experiments and data analysis. Students planned and performed their experiments on their own, developed simple computational (Python/ MATLAB) scripts to analyze the data with the help of task supervisors. A visit to COMPASS tokamak was held in the afternoon of March 5 to motivate them for the fusion research further.

On the last day (March 7) of the course, each group of students presented and discussed their experiment results and future plans. A list of the presentations follows-

Title of Presentation	**Presenters**	**Task Supervisor**
Density measurements by microwave inter-ferometry	Yevhen Siusko, Daniel Costa, Johan Buermans, Nadiia Lisovska	Mykyta Vavarin
Measurement of toroidal plasma rotation and electron temperature by double tunnel probe on the GOLEM tokamak	Naomi Mburu, Vladyslav Volkov, Georgii Sarancha	Jan Stöckel, Petr Macha
Turbulence measurements with the double rake probe	Anej Valic, Samad Khani, Dante Loi	Kateřina Jiráková
Study of runaway electrons at GOLEM	Soma Olasz, Aleksa Blažić	Pravesh Dhyani
Plasma position measurements and control	Mikhail Gorbun, David Weldon, Nikola Goleš, Maria Morbey	Jaroslav Čeřovský

For all the GOMTRAIC participants, accommodation was arranged at Henrietta Hotel in

Prague from March 03, 2019 (Sunday) to March 08, 2019 (Friday). All the participants were fully supported with five lunches and ... dinners during the workshop. In addition to this, welcome dinner and social dinner were arranged. Following the social dinner, participants shared warm moments by singing popular songs of their native countries. As a souvenir, GOLEM T-shirts were gifted to the GOMTRAIC participants.

Organizers have received students' feed-backs about their experience on the course and gave suggestions for future courses. Some of them are-

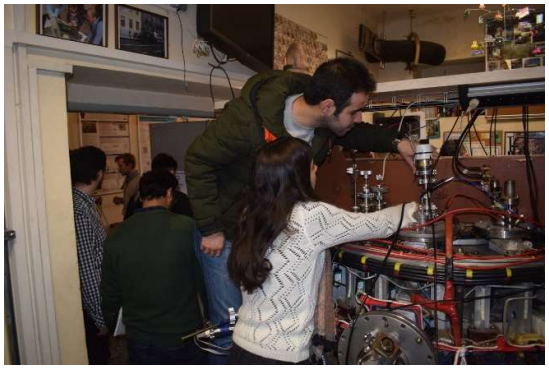
Georgii Sarancha: *…GOMTRAIC was very usefull for me – I've found new relations and now I can say, that I'm literally in International Community!...*

Nikola Goleš: *By far, there has not been a course where I have felt more as a part of a diverse and collaborative group than here in Prague. Throughout my stay I felt more than welcome and I am grateful for the warm hospitality that you showed to us……I would suggest changing - I would recommend extending the course by a day or two…*

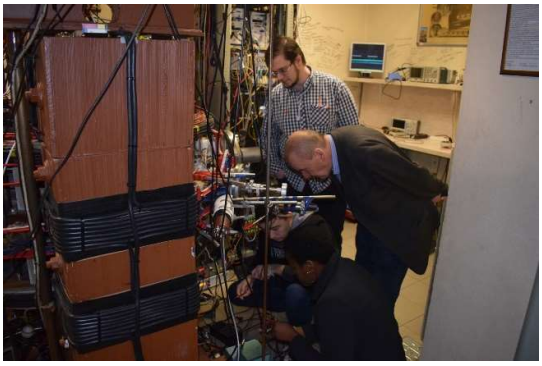
Daniel Costa: *…And the absolute best… The songbook idea! That was brilliant! Hands down the best way to finish GOMTRAIC…*

A glimpse of the GOMTRAIC-2019 is given in the pictures below-

RnDr. Jan St**ö**ckel introducing tokamaks and fusion diagnostics to the GOMTRAIC participants



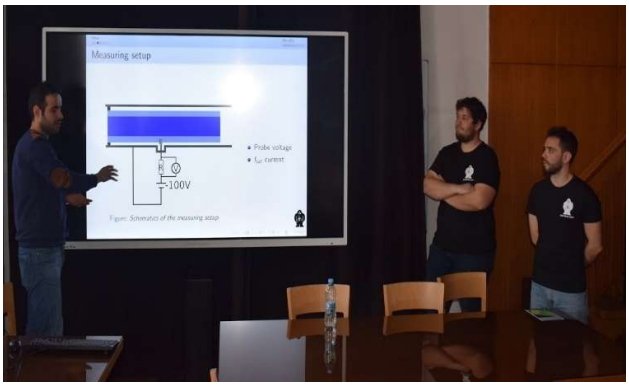
Students (Samad Khani, Maria Morbey) preparing diagnostics for measuring the basic plasma parameters in GOLEM tokamak



Naomi Mburu, Vladyslav Volkov and Georgii Sarancha adjusting the position of tunnel probe inside the GOLEM limiter with the help of RnDr. Jan Stöckel

GOMTRAIC participants visiting COMPASS tokamak at Institute of Plasma Physics in Prague

Students analyzing the experiment data and discussing with task supervisors



Students presenting experimental results

Time for delicious dinner after the hard work during the whole day

Some light moments! Students singing popular songs of their native countries.

Time to say good bye to GOLEM!!