



Commission for Developing Countries (CDC)

SCIENTIFIC/ PROJECT REPORT :

The objectives of the 2017 International Summer School on Multi-scale Analysis Methods and Applications (ISSMAMA) are the following: (1) introduce and explore various multi-scale analysis tools and discuss applications important in the current technology-driven economy, (2) foster the interdisciplinary collaboration between student and researchers from Math, physics and engineering on the area of analysis of multi-scale phenomena, (3) bring together the community of local and international like-minded peers, and (4) encourage a vibrant scientific and cultural exchange.

Lectures on multi-scale analysis methods and applications were conducted during the first week of the summer school. A research mentoring at the second week of the summer school reinforced the lectures conducted during the first week. Each group consisting of 6-7 participants were given multi-scale problems for them to understand, explore, extend and report on the last day.

The following experts from the field of Mathematics, Physics and Engineering gave several talks. The following table summarizes the lecturers and their lecture topics:

Lecturer	Position and Affiliation	Lecture Topics
Prof. Patrizia Donato	Professor, University of Rouen, France	Relevant topics from functional analysis, An introduction to homogenization, Tartar's method of oscillating test functions
Dr. A.K. Nandakumaran	Professor, Indian Institute of Science, Bangalore, India	Two-scale convergence for homogenization, homogenization of the optimal control for an



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		elliptic problem on a roughly oscillating domain, and introduction to optimization
Dr. Daniel Onofrei	Associate Professor, University of Houston, USA	An introduction to effective medium theory, asymptotic expansion and periodic unfolding method to homogenization of elliptic problems
Dr. Mary Donnabelle Balela	Associate Professor, University of the Philippines Diliman, Quezon City, Philippines	An introduction to nanotechnology and some applications to multi-scale analysis
Dr. Eduardo Cuansing Jr.	Associate Professor, University of the Philippines Los Baños, Laguna, Philippines	An introduction to quantum mechanics and some applications to multi-scale analysis
Dr. Alvin Karlo Tapia	Assistant Professor, University of the Philippines Los Baños, Laguna, Philippines	Some topics on materials science and applications to multi-scale analysis

Four (4) different groups of participants created at the second week were composed of mathematicians, physicists and engineers. Each group was mentored by the speakers themselves. There were three foreign speakers and four local speakers/mentors. About a third of the participants came from abroad while the rest are from the Philippines.

Some participants presented their ongoing researches during the second week of the summer school. A cultural night, cultural trip and some interactive physical games were also included in the social activities to be able to share the Filipino culture to foreign speakers and participants.

An evaluation of the summer school conducted shows success in terms of the over-all organization. However, some participants especially the physics and engineering students found it difficult to comprehend the Mathematics concepts needed for the school. The lecturers adjusted with this reality by extending extra time to accommodate those having difficulties. The mentoring part also helped because groups were composed of a mix of mathematicians, physicists and engineers.

Suggestions for a follow-up summer school also came up during the evaluation. Participants are also hopeful that some research collaborations will emanate from the school.

The organizing committee of ISSMAMA 2017 would like to extend its sincerest gratitude to the support of the IMU- Center for Developing Countries.



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