

Fatima Mohamad ABOUD
University of Diyala
College of Sciences
Department of Mathematics
Email: Fatima.aboud@univ-nantes.fr
Tel: +964(0)7700397254

Report of workshop organized by CIMPA
animated by
Prof Abdeljalil Nachaoui
08 to 14 May 2012

As a part of cooperation in the domain of scientific research in mathematics the CIMPA organized a series of workshops and meeting with the researchers in different fields of research of mathematics. In applied mathematics there were two workshops, each of them animated by Prof Abdeljalil Nachaoui (Université de Nantes- France) the first one has taken place for the period from 05 to 11 September 2011, the latest one has taken place from 08 to 14 May 2012. The program of the latest workshop contains some meetings with the undergraduate students and with the researchers in mathematics.

The program of this workshop was :

	morning	afternoon
08-May-12		workshop
09-May-12	meeting with students	workshop
10-May-12	workshop	workshop
11-May-12	Departure to Sulaimaniya	
12-May-12	meeting with researcher	seminar
13-May-12	seminar	seminar

The first three days contain a workshop entitled (**Free Boundary problem : theory and practice**) and a meeting with the students.

The last three days contain a meeting with researchers of Sulaimaniya and some seminars.

The lecture of the afternoon of 08 May presents an introduction with several physical examples of free boundary problems.

There were about 24 students and researchers from the different Universities:

- University of Salahaddin-Erbil :Dr Rostam, Dr Sami Dawood Gabbara, Dr Khwazbeen, Dr Ivan Subhi, Mrs Qumri Hayder,...
- University of Sulaimaniya : Dr Dhuha Majeed Alyassiri, Dr Ronak Mohammed Abdualah, Mrs Sudad Musa Rasheed, Mrs Payman Mahmood.
- University of Technology-Bagdad : Dr Sabah Aziz.

- University of Tikrit : Dr Raheam Ahmad Mansor Al-Saphory
- University of Basrah : Dr. Abdul-Sattar Jaber.
- University of Mosul : Mr Ahmed Farook.
- Students and researchers of the University of Diyala :
 Researchers: Dr Fatima M. ABOUD, Dr Khalid Khazaal and Miss Saraa Raad.
 Students : Mr Yahia, Mr Omer Nadhim, Mr Romat Mr Abdelrahman, Miss Rouaa Najim, Miss Douaa Jassim.

Prof Nachaoui has spoken about the history of the free boundary problems and he has presented some physical problems like Dam seepage, Die-swell problem, Bernoulli problem, Riabouchinsky flow past circular disks, Hagen-Poiseuille flows of a Bingham fluid, Falling droplet, Two-phase flow in porous media, Ice water Model and he has presented the mathematical model for each of these physical problems.

It was a little difficult to the students to understand the details of this introduction but it was really interesting to the researchers. In fact I have proposed to my students to assist to this workshop even if it is a little difficult to them to let them see some more application of mathematics in the practice life.

The participation of Miss Saraa Raad and Miss Douaa Jasim has entirely funded by CIMPA and the participation of the other students of Diyala has funded entirely by the college of sciences of University of Diyala.



From right to left

Standing up : Dr Abdulsatar, Dr Sabah, Dr Rahim, Mr Yahia, Dr Khalid, Prof Nachaoui, Dr Sami, Dr Fatima ABOUD, Mr Omer Nadhim, Mr Romat

Sitting down : Mr Abdelrahman, Miss Saraa Raad, Miss Rouaa Najim, Miss Douaa Jassim

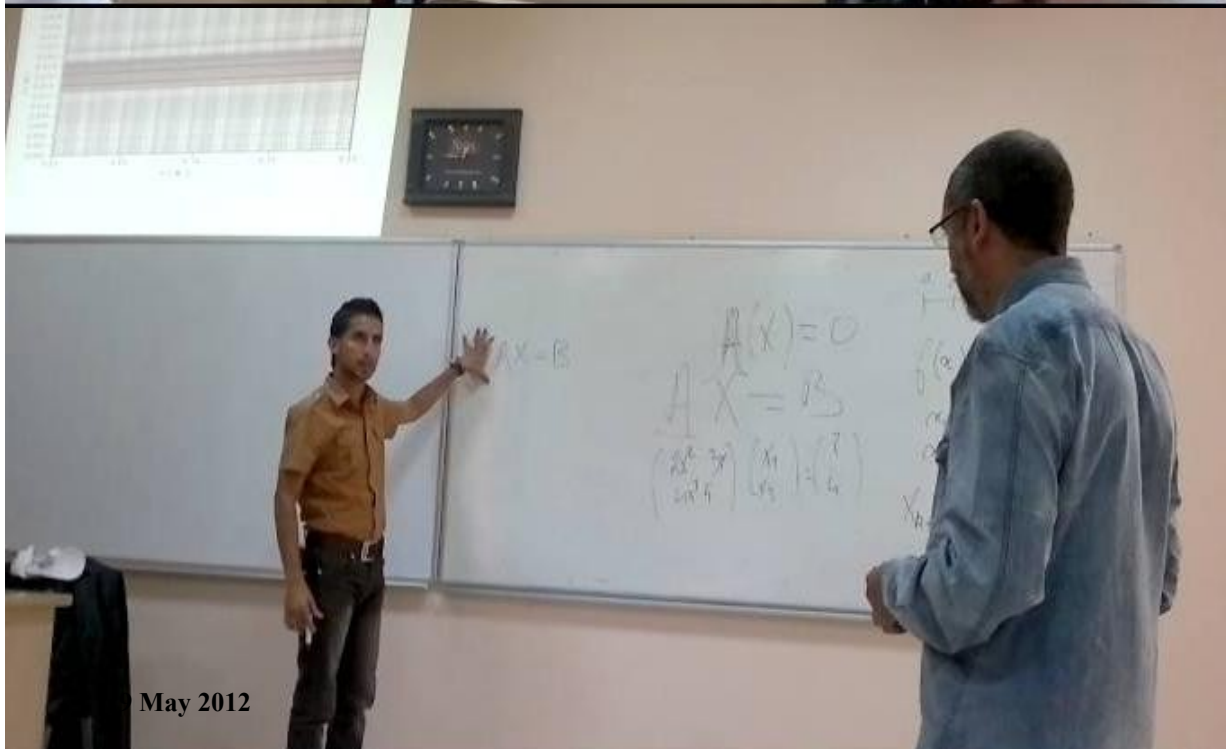
In the morning of 09 May there was a meeting with the undergraduate students of the University of Salahaddin and of the University of Diyala. The meeting was began with a lecture about **(Inverse problems in industrial processes in polymer shaping)** :



Meeting with students: 09 May 2012 Morning.



The name of the researchers and students who have assisted in the meeting: Dr Fatima ABOUD, Dr Khalid Khazaal, Miss Saraa Raad, Mr Yahia, Mr Omer Nadhim, Mr Romat Mr Abdelrahman, Miss Rouaa Najim, Miss Douaa Jassim, Miss Nour Amer Abood, Miss Sabaa Najim, Miss Souraa Najim.



Mr Abdelrahman (student of the University of Diyala) ask about the error of the approximation of the inverse problem.

The names of the students of University of Salahaddin: Miss Bushra Mahmod Hussin, Mr. Bakhshan Qasim Abdullah, Miss Dalya Abdulsalam Muhammad, Mr. Pshtewan Sa'adi Ahmed, Mr. Sabat Saeed Abdulrahman, Mr. Parzhen Fakhraddin Hussen, Hemdad Tahseen Ahmed and Mr. Hemn Ahmed Abdulrahman



Student of Erbil thanking Prof Nachaoui for his present to Erbil and for explanations that he given. She said that in her study she has never seen applications of mathematics and this is the first time that she see all these details and all these practical application of Mathematics. The meeting has motivated her to continue her studies in applied mathematics.



On behalf of Dr Tahseen Moubarak (the Dean of college of Science-University of Diyala), Dr Khalid Khazaal present a gift to Prof Nachaoui in name of the students of Department of Mathematics as a gratitude for his present to Iraq.

In the afternoon of 09 May, Prof Nachaoui has spoken about : A shape optimal design approach for some industrial boundary identification problems.

In which he has given a mathematical approaches to solve the free boundary problems and he has given a shape optimization approach like least square approach and fixed point approach.

In 10 May he has spoken about some boundary inverse problems and he has given some numerical methods to approach this class of problems and shown numerical results.

The participation of Dr Dhuha Majeed (University of Sulaimaniya), Dr Rahim AlSaphory (University of Tikrit), Dr Abdelsatar Jaber (University of Basrah) and Mr Ahmed Farook (University of Mosul) is funded partially by the CIMPA.

10 May 2012



From right to left: Mrs Qumri, Dr Ivan, Mrs Pyman, Dr Sabah, Dr Rahim, Prof Nachaoui, Dr Abdelsatar, Dr Ronak, Mrs Sudad, Dr Dhuha, Dr Sami.

In the morning of 12 May the Dean of the college of sciences-University of Sulaimaniya has invite Prof Abdeljalil Nachaoui and Dr Fatima Aboud, the coordinator of CIMPA, to his office to greet them and to present his best wishes to have a good stay in Sulaimaniya. This was followed by a meeting with researchers from Departments of Mathematics of Sulaimaniya (Dr Adil K. Jabbar, Dr Fraidun Hama Salh, Dr Shazad Shawki Ahmed, Dr Karwan Hama Faraj, Mr Mohammed Nokhas, Mrs Sudad Musa Rasheed, Mr Hardi Nasradeen, Mr. Shokhan Ahmed Hama Salih, Miss. Khelan Husien Qadir, Mrs. Payman Mahmood Hama Ali).

A discussion was about three directions of cooperation:

- Short visits for Sulaimaniya prof's.
- Split-site study for getting PhD.
- Post doctorate scientific visits.

Prof Nachaoui has given his agreement to invite Dr Fraidun and Dr Shazad for a one month visit for the month of September 2012 in the University of Nantes, the visit will be supported by Ministry of Higher Education-Kurdistan region-Iraq and by the University of Sulaimaniya.

For the other researchers their study will be funded by the University of Sulaimaniya with a split-site study system. The name and the specialty of the students of Sulaimaniya who wish to do PhD in France with split-site system:

- ▲ Mr Mohammed Nokhas, dynamical system.
- ▲ Mrs Sudad Musa Rasheed, functional analysis.
- ▲ Mr Hardi Nasradeen, topology.
- ▲ Mr. Shokhan Ahmed Hama Salih, Numerical analysis.
- ▲ Miss. Khelan Husien Qadir, Differential equations.
- ▲ Mrs. Payman Mahmood Hama Ali, algebra.

Name of the prof's who wish to have a short visit to France:

- ▲ Dr. Ronak Mohammad Abdullah, numerical optimization.
- ▲ Dr. Muzafar Fatah Hama, he has done his "doctorat" in France in functional analysis.
- ▲ Dr Karwan Hama Faraj, differential equations.

13 May 2012

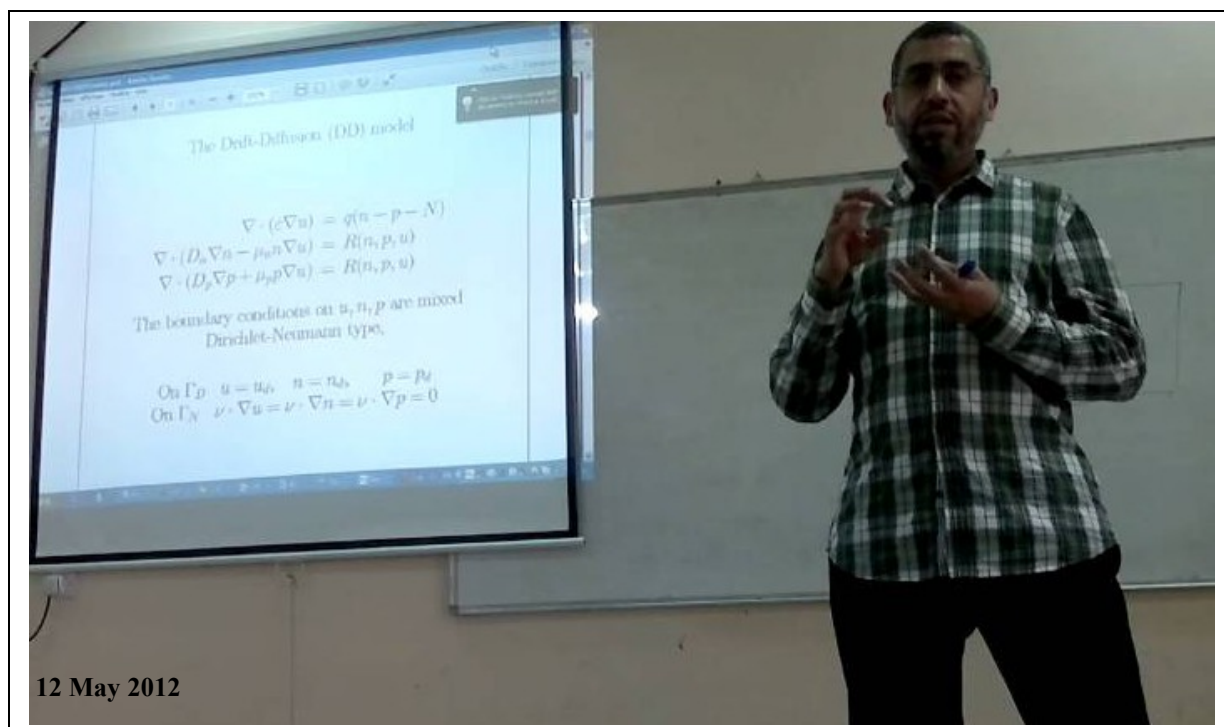


From right to left:

First line : Dr Fraidun, Fatima ABOUD, Dr Adil K. Jabbar, Mr. Mohammed Nokhas, Prof Nachaoui.

Second line : Mrs Pyman, Dr Shazad, Dr Karwan, Dr. Muzafar Fatah Hama.

In the afternoon of 12 may, Prof Nachaoui has spoken about (Iterative solution of the drift-diffusion equations):



There were about 18 researchers from different departments of Mathematics of University of Sulaimaniya with some physicians and some geologists.

The names of participants with them Interest Area:

- 1 Dr. Adil K. Jabbar, Algebra
- 2 Dr. Karwan Hama Faraj, Ordinary Differential Equations
- 3 Dr. Shazad Shawki Ahmed, Numerical Analysis
- 4 Dr. Muzafar Fatah Hama, Functional Analysis
- 5 Dr. Ayad Mohammed Ramadan, Optimization Theory
- 6 Dr. Ronak Mohammad Abdullah, Numerical Optimization
- 7 Dr. Halgord M. Darwesh, Topology
- 8 Dr. Faraidon Qadir Hama Salih, Numerical Analysis
- 9 Dr. Aras saeed mahmood, Physics (Solid States)
- 10 Dr. Bakhtiyar Qadir Aziz, Geophysics
- 11 Dr. Ari Ahmed, Physics
- 12 Dr. Broska Abdullah Azhdar, Physics
- 13 Mr. Mahamad Nawkhas Murad, Dynamical Systems
- 14 Mr. Sudad Musa Rashid, Functional Analysis
- 15 Mr. Payman Mahmood Hama Ali, Algebra
- 16 Mr. Khelan Husien Qadir, Ordinary Differential Equations
- 17 Mr. Shokhan Ahmed Hama Salih, Numerical Analysis
- 18 Mr. Hardi Nasradeen, Topology

In the morning of 13 May, Prof Nachaoui has continued his seminar about (Inverse problems in industrial processes in polymer shaping) by giving some more details about the modeling system and the numerical methods for the inverse problem.

In the afternoon, Dr Fraidun and Dr Shazad has presented them field of research.



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Dr Shazad speak about : (Generalized Taylor Matrix Methode for solving linear intergro-Fractional differential Equations of Voltera type)



13 May 2012

Dr Fraidun speak about : (Numerical solution of nonlinear ϕ^k equation using finite element method.

Prof Abdeljalil Nachaoui has explained to the colleagues the importance of doing research which can be used by others, in connection with what it is done elsewhere and not to work alone without contact with other researchers. He has explained also that one of the solution is that the colleagues try to work in teams with some physicians and engineers or with other researchers who are in contact with current areas on which scientists are activated.

In this report I would like to invite the Iraqi Universities to support the scientific programs of research and the scientific formation in different fields, in particular the scientific program of CIMPA which give a big possibility to the Iraqi researcher (in different domain of mathematical research and application) to have the opportunity to have the cooperation with the aboard researchers and to know the latest scientific achievements and to share their knowledge with colleagues from the same domain.

Finally, I would like to thank the CIMPA and the French embassy-Baghdad for supporting the scientific research in Iraq.

On behalf of the students of my department, I would like to thank the CIMPA and to the college of Sciences-University of Diyala for supporting them participation.

My great thanks to the University of Diyala, the University of Salahaddin and the University of Sulaimaniya for supporting my participation in the workshop.

Many thanks for the colleagues of department of Mathematics-College of Science-University of Salahaddin for hosting almost all the workshops organized by CIMPA in Kurdistan and for their kindness to well received the participants from different universities.

Many thanks to Prof Abdeljalil Nachaoui for accepting to animate theses series of seminars and for supporting many other scientific projects of research of mathematics in Iraq.

Some related links:

- <http://www.cimpa-icpam.org/>
- <http://workshop.uni-sci.org/index.html>
- <http://www.suh-edu.com/>
- <http://www.univsul.org/>
- <http://www.uodiyala.edu.iq/>
- <http://www.sciences.uodiyala.edu.iq/>

Fatima M. ABOUD
21 May 2012