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OCCASION

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22443

Training Course on Laser Diagnostics of Combustion Processes
18-22 November 2000, NILES, Cairo

Final Report

Host: National Institute for Laser Enhanced Sciences, NILES,
Cairo University, Giza, Egypt

Period: 18 November 2000 – 22 November 2000

Program Coordinator:

Associate Professor Mohy S. Mansour
Mechanical Engineering Department
The American University in Cairo, Cairo, Egypt
mansourm@aucegypt.edu

Local Organizers:

Professor Yehia Badr, Dean, NILES
Professor Yosr E. Gamal, Vice Dean of Postgraduate studies
Professor Mahmoud H. Abdel-Kader, Vice Dean of environment

Invited International Lecturers:

1. Prof. Assaad R. Masri
Mechanical and Mechatronics Engineering Department, The university of
Sydney, Australia.
2. Prof. Pinar Menguc,
Department of Mechanical Engineering, University of Kentucky, USA
3. Prof. Robert W. Pitz,
Mechanical Engineering Department, Vanderbilt University, Tennessee,
USA
4. Prof. Nevin Selcuk,
Chemical Engineering Department, Middle East Technical University,
Ankara, Turkey.
5. Dr. Giorgio Zizak,
Istituto Tecnologie dei Materiali e Processi Energetici, CNR-TEMPE,
Milan, Italy
6. Prof. Lotfia El-Nady,
Physics Department, Faculty of Science, Qatar University, Qatar
7. Eng. Helmut Kronewetter,
TSI, Aachen, Germany.

Invited Local Lecturers:

1. Prof. Mahmoud H. Abdel-Kader, NILES
2. Associate Prof. Mohy S. Mansour, The American University in
Cairo

3. Dr. Mahmoud F. Hassan, NILES

Participants:

A total of 50 participants have been accepted for attending the course, 15 international and 35 locals. In addition 8 assistants have contributed to the experimental sessions. The participants and invited lecturers represent seventeen countries:

Egypt – USA – Australia – Germany – Turkey – Qatar – Syria – Saudi Arabia – Kuwait – Algeria – Tunisia – Sudan – Morocco – Ghana – Nigeria – Gordon – Iran.

The lists of international and local participants are attached. Two of the international participants, no. 3 and 5 in the list, did not arrive, although prepaid tickets were forward to their countries. The Iranian participant did not get the visa due to embassy regulations that need a month to issue the visa. The participant from Kuwait sent an excuse few days before the course and it was difficult to substitute.

Summary:

A total of 18 lectures and 9 experiments, including NILES tour, have been conducted through a period of five days. Seven international lecturers and three locals have contributed to the course during the lectures and laboratory sessions. The course covered the following topics:

Basics of combustion; Combustion and Pollution; Pollution control; Basics of optics and spectroscopy; Light scattering and Imaging; Rayleigh scattering; Raman scattering; Laser Induced Photochemistry; Laser Induced Fluorescence; Lidar technique for pollution monitoring.

The experimental sessions covered the following techniques:

Flame emission spectra; Flame visualization; Rayleigh scattering; soot volume fraction; Laser Doppler Velocimetry; Planar Imaging Velocimetry; Phase Doppler Particle Analyzer. In addition a lab tour at NILES and demonstration of the Lidar system have been conducted.

The training course has attracted many local participants from academic and practical fields. So the local organization committee has accepted more participants than planed.

Main Achievement:

48 participants have been introduced to several important laser-based techniques for combustion and pollution diagnostics. They have also been trained through nine experiments that cover basic and advanced techniques on laser diagnostics of combustion processes.

Comments and Recommendations:

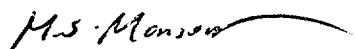
All participants and invited lecturers have been involved in the discussions during the closing session of the training course on Wed. 22 November 2000. The major comments and recommendations during the discussions are:

1. The course provided high quality of lectures and material
2. The lectures covered the basics and applications that are related to the topic of this course.
3. It is required to keep the high level of the course in future similar training course.
4. It may be recommended to move the training course from one country to another if the host institute has enough experimental facilities like those at NILES. Otherwise running the training course regularly at NILES should establish more experiments and hence improve the experimental skills of participants.
5. Demonstration of highly advanced techniques like Rayleigh, LIF and Raman requires more time. So, it may be recommended to demonstrate the basics of the experiments during the lab session and then show a complete experiment using videotapes.
6. It is recommended to establish a combustion research facilities center at NILES as a regional center for international trainee and cooperative research programs. So, researchers and engineers from neighbor developing countries are able to access these facilities through research programs supported by ICS, or similar organization.

Attachments:

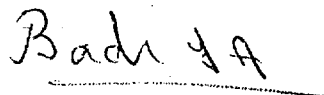
1. Program
2. List of international participants
3. List of local participants
4. Sample of certificate
5. Lectures
6. Experiments
7. Aide Memoire
8. Copy of application forms
9. Copy of evaluation sheets

Program Coordinator

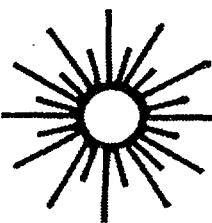


Mohy S. Mansour

Local Organizers



Yehia Badr



NATIONAL INSTITUTE OF LASER ENHANCED SCIENCES

N . I . L . E . S



جامعة القاهرة

المعهد القومي لعلوم الليزر

مكتب العميد

DEAN'S OFFICE

INVOICE NO:2/1

UNIDO
Field Operations and
Administration Division (FOA)
Financial Performance Control Branch (FPC)
General Services (GES)
P.O Box 300
A-1400 Vienna
Austria

Date : 4/12/2000

UNIDO Project no.: **TF/GLO/00/105**

UNIDO Contract No. : **2000/208**

Purpose of Payment : Sponsor the Training Course on Laser Diagnostics of
combustion processes, Nov . 18-22, 2000

US\$: 6290 \$

Upon Signature of Contract

(*as appropriate)

Please indicate the following :

(Bank) **NATIONAL BANK of EGYPT , CAIRO UNIVERSITY BANK**

(Address) **Cairo University, Giza , Egypt**

Post Code : 12613

Account No:

Name of Account Number : Training Course on Laser Diagnostics of combustion processes

Sort Code No.

(For payment by electronic transfer)

Owner of Bank Account Number: **11000169140**

NATIONAL INSTITUTE OF LASER ENHANCED SCIENCE

Please indicate authorized person (s) to administer funds under the above account :

Prof. Y. A. Bader

Bader. Y.A.

Associate Prof. M.S Mansour

M.S. Mansour

TERMS OF REFERENCE OF THE SUBCONTRACT

for the

*ICS Training Course on "Laser Diagnostics of Combustion Processes"
Cairo (Egypt), 18-22 November 2000*

1. Purpose of the Subcontract

The subcontract is requested for the organization of a Training Course on "*Laser Diagnostics of Combustion Processes*".

The contents of the course will deal with laser techniques for the diagnostics of combustion processes. The lectures will include: Introduction to the basics of combustion processes; chemistry and turbulence in combustion processes; practical combustion systems; combustion, pollution and environment; basics of optics and spectroscopy; flames, emissions and spectroscopy; laser-flame interactions; light scattering and imaging techniques flow field measuring techniques: LDV and PIV; Laser Induced Fluorescence techniques Rayleigh and Raman techniques; coherent anti-stocks Raman phase doppler anemometry for spray combustion; absorption and emission techniques.

The laboratory sessions will cover: flame emission and spectroscopy; flame visualization using Mie-scattering and fluorescence techniques.; Rayleigh scattering for single point measurements; LDV for velocity measurements; PIV demonstration; soot volume fraction measurements; Pollution monitoring; Laser Induced Fluorescence.

The implementation of the activity will be subcontracted to a local counterpart who will bear the hereunder stated responsibilities.

2. Duties and Responsibility for the Subcontractor

- Finalize in cooperation with the ICS Coordinator, the Project Document, the Aide-Mémoire, the announcement and the programme/agenda of the Training Course.
- Ensure that the Resource Persons provide written copies of their contributions in order to prepare the Final Report of the event.
- Identify suitable candidates for participation in the Training Course and prepare a list (bearing in mind that at least 50% of the participants should be coming from the industrial sector) to be submitted to the ICS Coordinator for the final selection.
- Provide all administrative and secretarial support for the organization and execution of the event.
- Prepare and organize all travel and logistics arrangements for both resource persons and participants in the Training Course (travel tickets, boarding, lodging, local transportation, etc.)

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- Make available, for the duration of the Training Course, suitable meeting rooms, lecture halls and laboratories with the required scientific equipment.
- In cooperation and consultation with the ICS Coordinator, be responsible for the carrying out of the programme according to the approved agenda.
- Evaluate, under the responsibility of the ICS Coordinator, the activities of the Training Course and the profile of each invited participants.
- Finalize and submit to UNIDO/ICS, within one month after the completion of the Training Course:
 1. a comprehensive report of the event;
 2. a comprehensive package of all written contributions presented at the Training Course, including, overheads, case studies, and examples (possibly in soft format);
 3. a list of recommendations and suggestions on how to improve the quality and cost-effectiveness of the events ICS-UNIDO intends to carry out in its future programme.

3. Dates of the Subcontract

From September to December 2000

4. Participants

15 international participants sponsored by ICS + 15 local participants
6 international experts sponsored by ICS + 3 national lecturers

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BUDGET

*ICS Training Course on "Laser Diagnostics of Combustion Processes"
Cairo (Egypt), 18-22 November 2000*

15 INTERNATIONAL PARTICIPANTS:

1. Travel: at an average rate for ticket of 900 US\$	13,500 US\$
2. Board and Lodging: 6 days at 55 \$ daily living expenses	<u>4,950 US\$</u>
	18,450 US\$

6 INTERNATIONAL LECTURERS:

1. Travel: at an average rate for ticket of 1200 US\$	7,200 US\$
2. Board and Lodging: 6 days at 115 \$ daily living expenses	<u>4,140 US\$</u>
	11,340 US\$

MISCELLANEOUS:

1. Mailing, communication costs and printing:	500 US\$
2. Local transportation:	<u>1000 US\$</u>
	1,500 US\$

TOTAL ICS CONTRIBUTION **31,290 US\$**

LOCAL SUPPORT:

The local funds cover:

1. Fees for local lecturers
2. Cost for local participants (15)
3. Set-up equipments and practical sessions
4. Others: site visit, entertainment .. etc.

TOTAL LOCAL SUPPORT **10,000.00 US\$??**

TOTAL COST OF TRAINING COURSE **41,290 US\$**

Please note that the budget which has been allocated to this activity must in no way be increased. Furthermore, under each itemized expenditure within the budget, no more than 10% excess can occur with obvious adjustments to other items to keep within the total.

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CONTRACT NO. 2000/208

between

THE UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

located at

Vienna International Center

Wagramerstrasse 5, P.O. Box 300, A-1400 Vienna, Austria
Tel.: 43-1 26026, Fax: 269 2669, GS Fax: 43-1-26026 6815/6

and the

NATIONAL INSTITUTE FOR LASER ENHANCED SCIENCES (NILES)

Cairo University

located at

Main Campus, Giza Street, Giza, 12613 Cairo, Egypt

for the

provision of services relating to the

Training Course on

"LASER DIAGNOSTICS OF COMBUSTION PROCESSES"

18 - 22 November 2000, Cairo, Egypt

UNIDO Project No.: TF/GLO/00/105

Purchase Order No.: 05-0-31018

VK/IR

21 September 2000

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1. **Contractor's Responsibilities**

In accordance with the terms and conditions stated herein and in the Annexes hereto the NATIONAL INSTITUTE FOR LASER ENHANCED SCIENCES (NILES), EGYPT, hereinafter referred to as "The Contractor", shall provide for the full and proper performance of its obligations under this Contract, all the services described in the Terms of Reference dated 13 September 2000. A copy of the Terms of Reference is attached hereto as Annex B and made a part hereof. All work required under this Contract shall be completed no later than December 2000.

2. **Contract Price and Payment**

UNIDO shall pay the Contractor for the full and proper performance of all obligations hereunder the sum of United States Dollars thirty-one thousand two hundred and ninety (US\$ 31,290). This sum shall cover all expenses incurred by the Contractor including, but not limited to, salaries, indemnities, social charges, overheads, technical assistance and supervision costs. The Contractor shall not do any work which may result in any charges to UNIDO over and above the sum of United States Dollars thirty-one thousand two hundred and ninety (US\$ 31,290) without prior written consent of UNIDO and a formal amendment to this Contract.

It is understood that, in case the actual number of the participants is smaller than stated in the Terms of Reference, the Contract price shall be adjusted accordingly.

3. **Entry into Effect of the Contract**

This Contract shall be deemed to be effective from the date of its signature by both Parties.

4. **Reports**

The Contractor shall submit to UNIDO, Vienna, a Final Report in English, in five (5) copies, covering the work done in accordance with paragraph 1, including a Financial Statement of expenses incurred, not later than December 2000.

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The Report shall be prepared in accordance with the "Basic Principles of Scientific Report Writing" (Annex C) and dispatched according to the "Instructions to Contractors for the Dispatch of Reports" (Annex D).

5. Payments

Payment on account of the Contract price set forth in paragraph 2. hereinbefore shall be made on the basis of the Contractor's invoice sent to UNIDO Vienna, as follows:

- a) upon signature of the Contract by both Parties,
the sum of US\$ 25,000
 - b) upon UNIDO's receipt and acceptance of the Final Report
as referred to in paragraph 4. hereinabove,
the sum of US\$ 6,290
- TOTAL US\$ 31,290

The Contractor shall pay at his own cost all the taxes, assessments, liens and charges which fall due and be payable by the Contractor as a result of this Contract.

The making of any payment hereunder by UNIDO shall not be construed as an unconditional acceptance by UNIDO of the work accomplished by the Contractor up to the time of such payment.

All payments under this Contract shall be made, subject to receipt by UNIDO of the Contractor's invoice in one (1) original and one (1) copy, by electronic transfer to the accounts indicated in the invoice.

6. Transmission of Reports, Invoices and Notices

All reports, invoices and notices submitted or given hereunder shall be addressed to the General Services (att. Mr. V. Koloskov, Contracts Officer), Financial Performance Control Branch, Field Operations & Administration Division, Wagramerstr. 5, P.O.Box 300, A-1400 Vienna, Austria.

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7. **Contract Amendment**

No modification of, or change in, this Contract, or waiver of any of its provisions, or additional contractual relationship with the Contractor shall be valid unless approved in the form of a written amendment to this Contract, signed by the Contractor and the UNIDO, Director, General Services, Financial Performance Control Branch, Field Operations & Administration Division, or his representative.

8. **Covenant against Contingent Fees**

The Contractor warrants that:

- a) no person or selling agency has been employed or retained by him to solicit or secure this Contract upon an agreement or understanding for a commission, percentage, brokerage, contingent fee or retainer, except regular employees or bona fide and officially established commercial or selling agencies maintained by the Contractor for the purpose of securing business;
- b) no official or servant or retired employee of UNIDO, the United Nations, the UNDP and the Participating and Executing Agencies of the UNDP or the Government and/or its co-operating Agency(ies), who is not a bona fide employee of the Contractor, has been or shall be admitted by the Contractor to any direct or indirect benefit arising from this Contract or the award thereof.

For breach of these warranties, UNIDO shall have the right to deduct from the Contract price, or otherwise recover from the Contractor, the full amount of any such commission, percentage, brokerage, contingent fee or retainer so paid.

9. **Default by the Contractor**

In case the Contractor fails to fulfil his obligations and responsibilities under this Contract, and provided the Contractor has not remedied such failure(s) within thirty (30) days of having been given UNIDO's express written notification of the nature of the failure(s), UNIDO may, at its sole option and without prejudice to its right to withhold payment(s) as hereinbefore provided, hold the Contractor in default under this Contract.

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When the Contractor is thus in default, UNIDO may, by giving written notice to the Contractor, terminate the Contract as a whole or such part or parts thereof in respect of which the Contractor is in default. Upon such notice, UNIDO shall have the right to seek completion, at the Contractor's expense, of that part or those parts of the Contract with respect to which the Contractor is in default. The Contractor shall, in this case, be solely responsible for any reasonable costs of completion, including such costs which are incurred by UNIDO over and above the originally agreed Contract price stipulated hereinbefore.

10. General Conditions

The Parties hereto agree to be bound by the UNIDO General Conditions of Contract a copy of which is attached hereto as Annex A.

IN WITNESS WHEREOF, the Parties hereto have executed this Contract.

NATIONAL INSTITUTE FOR LASER
ENHANCED SCIENCES (NILES)

UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION

By Bochi y A.

By [Signature]

Cairo University
Main Campus, Giza Street
Giza
12613 Cairo
EGYPT

V. Koloskov
Contracts Officer
General Services
Financial Performance Control Branch
Field Operations & Administration Div.
P. O. Box 300
A-1400 Vienna
AUSTRIA

Date 21.09.2000

Date 21.09.2000

Enclosures

- Annex A : General Conditions of Contract
- Annex B : Terms of Reference dated 13 September 2000
- Annex C : Basic Principles of Scientific Report Writing
- Annex D : Instructions to Contractors for the Dispatch of Reports

[Signature]
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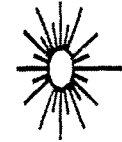


ICS

NILES



Training Course on
«Laser Diagnostics of Combustion Processes»
18th – 22nd November, 2000



Program



ICS NILES

Training Course on
 «Laser Diagnostics of Combustion Processes»
 18th – 22nd November, 2000



	Time	Activity	Speaker	Session Chairman
Sat. 18 th November	8:30 - 9:00	Registration		
	9:00 - 9:45	Opening Ceremony and Introduction <ul style="list-style-type: none"> ▪ Prof. Y Badr ,Niles Dean. ▪ Mr. Giuseppe Marino, Scientific Attach, Italian Embassy. ▪ Mr. Kenichi USHIKI, Program Officer, ICS. ▪ A.Prof. Mohy S. Mansour, Program Coordinator. 		
	9:45 - 10:15	Coffee Break		
	10:15 - 11:15	Lecture (1) "Introduction to combustion"	Mohy S. Mansour	Lotfia El-Nady
	11:15 - 12:15	Lecture (2) "Turbulence and Chemistry in Combustion Processes"	Assaad R. Masri	
	12:15-13:15	Lecture (3) "Combustion and Pollution"	Nevin Selçük	
	13:15 - 15:00	Lunch Break		
	15:00 – 16:00	Lecture (4) "Practical Combustion Systems and Pollution Regulations"	Nevin Selçük	Mahmoud Hashem
	16:00 – 17:00	Lecture (5) "Basics of Optics and Spectroscopy"	Lotfia El-Nady	
	17:00 – 18:00	Lecture (6) "Flame Emissions and Spectroscopy"	Giorgio Zizak	



ICS NILES



Training Course on
«Laser Diagnostics of Combustion Processes»
18th – 22nd November, 2000



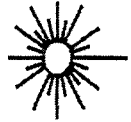
	Time	Activity	Speaker	Session Chairman
Sun. 19 th November	9:00 – 10:00	Lecture (7) "Light Scattering and Imaging Techniques "	Pinar Mengüç	Yosr E. Gamal
	10:00 – 11:00	Lecture (8) "Flow Measuring Techniques :LDV "	Helmut Kronewetter	
	11:00 – 11:15	Coffee Break		
	11:15 – 12:15	Lecture (9) "Flow Measuring Techniques :PIV "	Helmut Kronewetter	Mohy S. Mansour
	12:15 – 13:15	Lecture (10) "Rayleigh and Raman Techniques "	Robert W. Pitz	
	13:15 – 15:00	Lunch Break		
	15:00 – 16:00	Laboratory: A1, B2, C3 *		
	16:00 – 17:00	Laboratory: A2, B3, C1		
	17:00 – 18:00	Laboratory: A3, B1, C2		



ICS NILES



**Training Course on
«Laser Diagnostics of Combustion Processes»
18th – 22nd November, 2000**



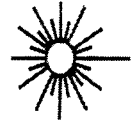
	Time	Activity	Speaker	Session Chairman
Mon. 20th November	9:00 – 10:00	Lecture (11) "Laser Induced Photochemical Processes"	Mahmoud Hashem	Giorgio Zizak
	10:00 – 11:00	Lecture (12) "Laser Induced Fluorescence , Rayleigh Scattering and Combination Techniques"	Robert W. Pitz	
	11:00 – 11:15	Coffee Break		
	11:15 – 12:15	Lecture (13) "Phase Doppler Particle Analyzer "	Helmut Kronewetter	Pinar Mengüç
	12:15 – 13:15	Lecture (14)"Featuring Ozone Dynamics By Infrared(CO ₂ -TEA) Lidar-Dial Technique"	Taieb Gasmi	
	13:15 – 15:00	Lunch Break		
	15:00 – 16:00	Laboratory: A4, B5, C6		
	16:00 – 17:00	Laboratory: A5, B6, C4		
	17:00 – 18:00	Laboratory: A6, B4, C5		



ICS NILES



Training Course on
«Laser Diagnostics of Combustion Processes»
18th – 22nd November, 2000



	Time	Activity	Speaker	Session Chairman
Tue. 21 st November	9:00 – 10:00	Lecture (15) “Laser Induced Incandescence ”	Giorgio Zizak	Assaad R. Masri
	10:00 – 11:00	Lecture (16) “Optical Measuring Techniques and Application ”	Mahmoud F. Hassan	
	11:00 – 11:15	Coffee Break		
	11:15 – 12:15	Lecture (17) “Case Study: Raman –Rayleigh– LIF Measurements and Data Reduction ”	Assaad R. Masri	Robert R. Pitz
	12:15 – 13:15	Lecture (18) “Case Study: Laser Measurements in Turbulent Premixed and Partially Premixed Flames ”	Mohy S. Mansour	
	13:15 – 15:00	Lunch Break		
	15:00 – 16:00	Laboratory: A7, B8, C3		
	16:00 – 17:00	Laboratory: A8, B3, C7		
	17:00 – 18:00	Laboratory: A3, B7, C8		
20:30 – 22:30	“Workshop Dinner” and Nile Cruise.			



ICS NILES



Training Course on
«Laser Diagnostics of Combustion Processes»
18th -22nd November, 2000



	Time	Activity	Speaker	Session Chairman
Wed. 22 nd November	9:00 – 10:00	“Case study and Laboratory: A9, B+C10” *		
	10:00 – 11:00	Laboratory: B9, A+C10		
	11:00 – 11:15	Coffee Break		
	11:15- 12:15	C9, A+ B10		
	12:15- 13:15	“Discussions and Closing”		
	13:15 – 14:15	Lunch Break		
	14:30 – 18:00	“ Trip to Pyramids and Entertainment”		
	18:30 – 19:30	Sound and Light at Pyramids		
	20:30 – 22:30	Dinner		

* 10 Special discussion to be planned in advance.

List of Foreign Participants

S	Name S F M			Country City	Fax/Tel	Subject of Specialization	Email
1.	Boudjemai	Said		Algeria Algiers	-213-2-27-93-93 213-2-50-66-73	Electronics	
2.	Paul K.	Buah	Bassuah	Ghana Cape coast	-233-42 32446 233-42-32446	Physics	
3.	Salami	Seyed	Hamid	Iran Tehran	17/11/2000 23/11/2000	-98-21-601-3128	Mechanical Engineering
4.		Ali	Al-Akras	Jordan Irbid	96227095014		Salaami@sharitnet.co.ir
5.	Habib	Khaled	J.	Kuwait Safat	17/11/2000 23/11/2000	-965-5430239 965-543-239	Chemical Engineering
6.	Magdesi	Yacob	Yousif	Kuwait		Laser Kuwait Univ., Physics Dept.	Yacob@dr.com.
7.	Mekkaoui	Alaoui	Ismail	Morocco Marrakech	-212-4-4437410 212-4-308563	Laser Induced Luminescence	Mekkaoui@ucam.ac.ma I-mekkaoui@yahoo.com.
8.	Mudashiru	Liadi	Kolapo	Nigeria ILE-FE, osunstate	-234-12-936896 234-36-230290	Invirmental Chemistry	Adjebah@oauife.edu.ng
9.	Badr	Osama	Ahmed	Qatar Doha	-974-4852491 974-4660491	Combution	
10.	Masoudi	Husain	Muhammad	Saudi Arabia	96638604281 96638604984	Optical Fiber Communication	
11.	Gasmi	Taieb		Spain Madrid	-3491-3943279 3491-3943275	Optics & Laser Physics	
12.	Sir El-Khatim	Amna	Hassan	Sudan Khartoum	-00249-11-788370	Physics / Lasers	Amnhsn@hotmail.com Amnasirelkhathim@yahoo.co.uk
13.	Al-Jghami	Issam	Fawaz	Syria Damascus	-963-112119896 963-116712945	Atomic & Molecular Spectroscopy	
14.	Gogebakan	Yusuf		Turkey Ankara	-90-3122101264 90-3122104398	Fluidized Bed Combustion	
15.	Tarhan	Tanil		Turkey Ankara	-90-312-2101264 90-3122561418	Computational Fluid Dynamics	

List of Egyptian Participants

S	Name			Country City	Institut	Fax/Tel	Subject of Specialization
	S	F	M				
1.	Abd El-Zaher	Hany	Sharkay	Egypt Giza	Egyptian of Orgainzation and Standardzation and Quality Control – Cairo	- 2023140940	Physics
2.	Fawzy	Mahmoud		Egypt Giza	NILES – Cairo Univ.	-20-18-223719 20-18-226740	Industrial Engineering
3.	Khalil	Ahmed	Asaad	Egypt Cairo	NILES – Cairo Univ.	-202-5729499 202-3655681	Plasma Physics
4.	El-Sabkh	Hebat-Al-Rahman	Ahmed	Egypt Cairo	NILES – Cairo Univ.	- 2023634880	Laser Material interaction
5.	Mohamed	Ibrahim	Kamal	Egypt Giza	High institute of energy – Aswan	- 2025010219	Fluid Mechanics
6.	Aissa	Walid	Aniss	Egypt Cairo	High institute of energy – Aswan	- 25849314	Fluid Mechanics
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