



DIPARTIMENTO DI SCIENZE
MATEMATICHE E INFORMATICHE,
SCIENZE FISICHE E SCIENZE DELLA TERRA
Dottorato di Ricerca in Fisica

**VERBALE DELLA RIUNIONE DEL COLLEGIO DEI DOCENTI
DOTTORATO DI RICERCA IN FISICA
UNIVERSITÀ DEGLI STUDI DI MESSINA
3 febbraio 2023**

Il giorno 03 febbraio 2023 dalle ore 08.00 alle ore 13.30, si è riunito ad horas in seduta telematica (via e-mail) il Collegio dei Docenti del Corso di Dottorato di Ricerca in Fisica dell'Università degli Studi di Messina, per deliberare sul seguente punto all'ordine del giorno:

- 1) Richiesta di attivazione di co-tutela di tesi in ingresso (incoming) - ciclo XXXVII ciclo.

Partecipano i Professori: Giorgio Arcadi, Caterina Branca, Michele Calabretta, Francesco Caridi, Carmelo Corsaro, Dino Costa, Maria Cristina Curatolo, Omar Di Stefano, Barbara Fazio, Enza Fazio, Maria Antonia Iati, Salvatore Magazù, Domenico Majolino, Giuseppe Mandaglio, Onofrio Maragò, Gianmarco Munaò, Fortunato Neri, Barbara Orecchio, Salvatore Patanè, Alessandro Pilloni, Debora Presti, Santi Prestipino Giarritta, Rosaria Anna Puglisi, Franz Saija, Rosalba Saija, Salvatore Savasta, Letteria Silipigni, Roberto Stassi, Lorenzo Torrisi, Antonio Trifirò, Marina Trimarchi, Sebastiano Trusso, Valentina Venuti, Valentina Villari, Ulderico Wanderlingh.

Risultano assenti non giustificati i dott. Mariapompea Cutroneo

Constatato il raggiungimento del numero legale, il Coordinatore del Collegio dei Docenti del Corso di Dottorato di Ricerca in Fisica, Prof.ssa Vincenza Crupi, dichiara aperta la seduta.

Il Dott. Francesco Caridi svolge il ruolo di segretario verbalizzante.

Punto 1) O.d.G.

Richiesta di attivazione di co-tutela di tesi in ingresso (incoming) - ciclo XXXVII ciclo.

Il Coordinatore informa il Collegio dei Docenti, che la dott.ssa **Balkis Abdelaziz** iscritta al II anno del programma di dottorato in Fisica (PhD student in Physics) presso la Faculte des Sciences de Monastir - Universite de Monastir (Tunisia), sotto la supervisione del prof. Sahbi Ayachi, Full Professor presso la stessa Università, chiede l'attivazione della procedura di cotutela di tesi in ingresso tra l'Università di Monastir-Tunisia (Home Institution) e l'Università degli Studi di Messina (Host Institution), con conseguente iscrizione al Corso di Dottorato di Ricerca in Fisica XXXVII ciclo (II anno), come risulta da richiesta prot. N. 9957/2023 del 26/01/2023. Il progetto di ricerca in cotutela di tesi dal titolo *Contribution to the understanding of the optoelectronic properties of new low-gap organic materials for organic electronics*, verrà realizzato sotto la supervisione congiunta del Prof. S. Patanè (Host Institution) e del prof. Sahbi Ayachi (Home Institution).

Il Coordinatore ricorda che l'**Art. 32 - Dottorati di ricerca in cotutela di tesi - comma 3** del Regolamento del Dottorato di Ricerca - Università degli Studi di Messina (DR 834-2022. Prot. n. 0039784 del 25/03/2022), recita che:

3. La cotutela di tesi è attivata, su richiesta dell'interessato, a favore di dottorandi iscritti al primo anno di Corso. Il Collegio dei docenti può autorizzare l'attivazione di un programma di cotutela di tesi per dottorandi iscritti tra il primo e il secondo anno di Corso, qualora sussistano particolari interessi di carattere scientifico.

Premesso ciò, il Coordinatore sottolinea che la dott.ssa Abdelaziz, già da tempo collabora con il collega Salvatore Patanè, sulle tematiche di ricerca del progetto proposto, ed ha uno specifico interesse scientifico ad approfondire la sua attività di ricerca presso il nostro Ateneo sotto la sua co-supervisione.

Dipartimento MIFT

Coordinatore del Dottorato di Ricerca in Fisica Prof.ssa V. Crupi – vcrupi@unime.it – 0906765004
Responsabile Unita' di Staff Didattica Dott.ssa P. Donato – pdonato@unime.it – 0906765448



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Tutte le condizioni necessarie per l'attivazione della procedura (accordo quadro già firmato con il Paese in cui si trova l'Università partner, nel presente caso l'Universite de Monastir - Tunisia) sono già state accertate con l'Ufficio preposto dell'U.OP. Dottorati. Si allegano al presente verbale:

- sintesi del progetto di ricerca;
- bozza della Convenzione nominativa con il dottorando interessato alla cotutela di tesi che dovrà essere in seguito approvata dagli organi accademici, una volta che il Collegio di Dottorato ha deliberato favorevolmente.

Dopo approfondita discussione, essendo state soddisfatte tutte le condizioni necessarie per l'attivazione della cotutela, essendo stata fornita documentazione completa e considerato infine che l'Ateneo di Messina favorisce ed incoraggia la realizzazione dei programmi di cotutela di tesi, **il Collegio delibera favorevolmente sull'attivazione del programma di cotutela approvando all'unanimità con la sola astensione degli assenti alla seduta.**

Non essendo presenti altri punti all'O.d.G., il Coordinatore ringrazia tutti i colleghi che hanno partecipato alla riunione telematica del Collegio e chiude la seduta alle ore 13.30 con l'approvazione seduta stante del presente verbale.

Il Segretario
(Dott. Francesco Caridi)

Il Coordinatore
del Corso di Dottorato di Ricerca in Fisica
(Prof.ssa Vincenza Crupi)

Messina, lì 03 febbraio 2023



Description of the joint research project

Title : Contribution to the understanding of the optoelectronic properties of new low-gap organic materials for organic electronics.

Summary :

The thesis project aims to design new organic materials -conjugated with potential applications in optoelectronics such as organic light-emitting diodes (OLEDs) and organic solar cells (OSCs). We propose to design and study a well-structured molecular architecture, integrating electron-donor and electron-acceptor moieties, using theoretical chemistry calculations based on density functional theory (DFT) and the TD-DFT method. Furthermore, we will focus on the correlations between the structure and the physical properties of new functional organic materials. We will use COMSOL Multiphysics software to simulate the behavior of suitable multilayered structure, with special attention to the I-V current-voltage characteristics and the spectral response of solar cells. The emission properties of organic light-emitting diodes will be also simulated in the framework of a smart optimization of the structure. The organic molecules that will be studied are of the push-pull type and are qualified as low electronic gap materials. Also, they exhibit a charge transfer at the interface. Moreover, the theoretical approach used provides robust and efficient means to model and characterize the intramolecular charge transfer mechanisms.

Signature of the doctoral student

Balkis abdelaziz

Agreement of joint thesis supervision
between
Faculty of sciences, University of Monastir
and
Università degli Studi di Messina

THE UNDERSIGNED:

The Faculty of Sciences of Monastir, Avenue de environment 5019 Monastir, Tunisia, jointly referred to as “FSM”, represent by **the Dean, Prof. Mohamed Mongi BEN SALEM**, under the University of Monastir (**Home Institution**) , located at Avenue Taher Haded 5019 Monastir,

represented by **Prof Hedi BEL HADJ SALAH, Rector**,

And

Università degli Studi di Messina (University of Messina), Piazza Pugliatti 1, 98121, Messina, Italy,

Here in after referred to as “UNIME” (**Host Institution**),
represented by **Prof. Salvatore Cuzzocrea, Rector**,

in which the aforementioned parties are jointly referred to as ‘the parties’,

Considering

the Framework Cooperation Agreement of Culture and Scientific Cooperation between Università degli Studi di Messina and the University of Monastir (prot. n°352/2017) and seen the art. 32 of the Regulation concerning Research Doctorate Course issued with the Rector’s Decree n. 834/2022

Having regard for University de Monastir (Tunisia):

- The decree n° 2013-47 of January 4th, 2013 fixing the general framework of the regime of the studies and the conditions of obtaining the national diploma of doctorate in the system "LMD";

Having regard for UNIME (Italy)

- the art. 4 of the Italian Law n. 210 of 03/07/1998, that provides for the Universities’ autonomy in setting up PhD courses within Universities’ governmental, educational and scientific autonomy, as modified by the Law n. 240/2010;
- the Italian Ministry of Education, University and Research Regulation concerning PhD programmes, issued with D.M. n. 226/2021;

- the University of Messina Regulation concerning Research Doctorate course issued with the Rector's Decree n. 834/2022;
- the report of Academic Boards of UNIME that approves doctoral student's application

The following has been agreed:

Article 1-JOINT THESIS SUPERVISION

The partner institutions hereby agree that they shall assume joint responsibility for the supervision of the doctoral student's doctoral research project. The two Institutions, animated by the will to promote the exchange of PhD students between them and to strengthen, thus, scientific and university cooperation, decide by mutual agreement, within the framework of the legislations in force in their respective countries, to use the procedure of co-supervision of thesis in favour of the Doctoral Student:

- Name and surname of the student: Balkis abdelaziz
- Born in : 16/12/1997, Mahdia, Tunisia.
- E-mail: balkisabdllz2018@gmail.com
- Telephone number: +39 3517312324, +216 25149723
- Bachelor Degree: in Fundamental Physics (2016-2019)
- Master Degree: in quantum physics (2019-2021)
- Registered as a doctoral student at University of Monastir, Doctorate of Philosophy Programme in " physics" as stated in University of Mob nastir enrolment certificate number 2100004, dated 2021/2022.

Article 2 – Supervision of the doctoral student

In each of the institutions concerned, the doctoral student will carry out the research work under the direction and responsibility of the following thesis supervisors:

- At FSM,UNI Monastir (Home Institution):

Name: Prof. Sahbi Ayachi
Department: department of physics
Position: Full Professor

- At UNIME (Host Institution):

Name: Prof. Salvatore Patanè
Department: Scienze Matematiche e Informatiche, Scienze Fisiche e Scienze della Terra (MIFT)
Position: Full Professor

Both thesis Supervisors undertake to fully exercise, jointly with the doctoral student, the responsibilities attributed to them by the regulations in force and the academic traditions in their respective countries. They shall also undertake, in their respective establishments, to ensure the implementation of the provisions of this Agreement.

The doctoral student shall follow the activities of the doctoral programs during his staying at Uni Monastir and at UNIME as agreed by the two Supervisors, according with the regulations of both the PhD courses involved.

ARTICLE 3 – ADMISSION TO DOCTORAL STUDIES AND DOCTORAL THESIS SUBJECT

The doctoral student will be admitted at the second year of academic year 2022/2023 of the Doctoral course in Fisica (Physics). The doctoral program lasts three years and will end on September 30th, 2025.

The doctoral student is already registered at University de Monastir at Doctoral course in “physics”, academic year 2022/2023. The doctoral programme for the student lasts three years and will end at September 30th, 2025.

The subject of the thesis submitted by the doctoral student “contribution to the understanding of the optoelectronic properties of new low-gap organic materials for organic electronics”

Article 4– ENROLLMENT AND STUDENT SERVICE FEE

The doctoral student must be enrolled in both institutions. She must pay registration fees in Tunisia (Home Institution). She is exempt from these same rights to the other establishment (Università degli Studi di Messina).

Article 5 – AWARD OF THE DEGREE

If the doctoral student has passed the joint doctoral examination successfully, she shall be separately awarded a degree by the partner institutions as follows:

- Doctor (Ph.D) in “physics” (**FSM, Uni Monastir**)
- Dottore di ricerca (Ph.D) in “Fisica” (Physics)” (**UNIME**)

Article 6 – INSURANCE COVER

During her stay in the host country, the doctoral student benefits from the social security cover, in accordance with the legislation in force. During her stay at UNIME, the Host partner guarantees third party liability and accident insurance within the limits established by the Italian law. In Italy, in addition to that, before starting mobility periods abroad, the doctoral student takes all necessary steps in order to arrange health insurance, insurance cover against physical injuries and third party liability whilst performing her duties within the framework of the doctoral research project. During mobility periods abroad, the Doctoral Candidate should also have insurance covering repatriation in case of accident or illness.

Article 7– RESEARCH AT PARTNER INSTITUTION

The research work is carried out alternately in both institutions. The doctoral student should spend alternate or consecutive research equivalent periods at both partner institutions. The period of the joint research activities will be agree by the two Supervisors as following:

- expected periods at UNIME (Italy) : From ___ January_____ to _____ September _____ and from ___April_____ to _____June _____ (__12__ months)
- expected periods at FSM (Tunisia) : From ___ October _____ to ___March_____ and from ___July_____ to ___December _____ (__12__ months)

Due to the COVID-2019 emergency, the possibility of varying the periods of stay in the two universities will be considered.

ARTICLE 8 – ADMISSION AT THE ONLY FINAL EXAMINATION AND THESIS DEFENCE COMMITTEE

The partners agree that the deadline for the submission of the final thesis will be on September 30th, 2025.

According to both institutions rules, to obtain the admission at the single final examination, the thesis will be evaluated by two external reviewers full professors (one from each country). If the evaluation of the reviewers is positive and they don't ask for modifications of the thesis, the final examination could be taken until January 2026. If the evaluation of the reviewers is positive, but they ask for modifications of the thesis, the final examination could be postponed until six months and could be taken until June 2026. According to the Tunisian rules, the two institutions have to consider that the student has to publish a scientific publication (In a journal with IF as first author) to be admitted at the final examination. The student will have to submitted her scientific publication in due time to allow the final examination. The only Examination Board shall be comprised of six members including the two thesis supervisors, that don't evaluate the candidate. In accordance with regulations in force, the Defense Committee is made up of a balanced number of members appointed by the two institutions and includes at least two members external to both universities. At least two thirds of the members of the Examination Board must be Academic professors.

Article 9 – DOCTORAL THESIS DEFENSE (PUBLIC DISCUSSION)

The thesis will lead to a single defense in __FSM_____. The only report of the Examination Board will be in French and in Italian language (or only in English). The institution organizing the defense, undertakes to issue the title of Doctor and to transmit a copy of the complete defense file to the partner institution which undertakes, in turn, to issue the title of Doctor as provided by art 5.

Article 10 – LANGUAGE OF THESIS

The doctoral thesis will be drawn up and defended in English, whereas the written and oral summary will be in _____English_____. An abstract of the doctoral thesis shall be supplied in _____English_____.

ARTICLE 11 – INTELLECTUAL PROPERTY RIGHTS

Intellectual property ownership will be based on the principle of inventor owns in accordance with the respective policies of each of the partner institutions.

Therefore, the protection of the research results arising from the doctoral research project, as well as any matter related to filing them, making them accessible, their publication and exploitation shall be discussed and agreed by the partner institutions and be in accordance with the national and institutional regulations in force.

ARTICLE 12 –PROCESSING OF PERSONAL DATA

The processing of personal data related to this call is carried out by the University in accordance with the European General Regulation No. 679/2016 for the protection of personal data and the Code regarding the protection of personal data, Legislative Decree No. 196/2003 and subsequent amendments and additions.

ARTICLE 13 – DEPOSIT COPY AND PUBLICATION OF THE PHD THESIS

Details regarding the deposit copy, authorial information and printing the PhD thesis are set out in the applicable regulations of each higher education institution.

The publication of the PhD thesis is guaranteed by both higher education institutions in

accordance with their applicable regulations.

ARTICLE 14 – COMMENCEMENT AND VALIDITY OF THE AGREEMENT

The present agreement shall take as and from the date of its execution by the authorized representative of each contracting Institution and expires at the end of final examination procedure.

ARTICLE 15 – VALIDITY OF THE AGREEMENT AND SETTLEMENTS OF DISPUTES

The stipulations of this agreement may not conflict with the provisions of the regulations at of the two Institutions. Disputes must be resolved amicably through friendly bilateral consultations.

Modifications to this agreement shall be effective only if they are in writing and signed by the authorized representatives of the contracting parties

Signatures

Drawn up in four original copies

For the University of Monastir

Rector : Prof .Hedi Bel Hadj Salah

date: _____

Dean : Prof. Mohamed Mongi BEN SALEM

date: _____

The Director of the Doctoral school : Prof. Abdelaziz Bouazizi

date: _____

The Thesis Supervisor: Pr Sahbi Ayachi

date: _____

For the “Università degli Studi di Messina”

Rector: Prof. Salvatore Cuzzocrea

date: _____

PhD Programme Coordinator: Prof.Vincenza Crupi

date: _____

Thesis Supervisor: Prof. Salvatore Patanè

date: _____

For acceptance

The doctoral student : Balkis Abdelaziz

date: _____