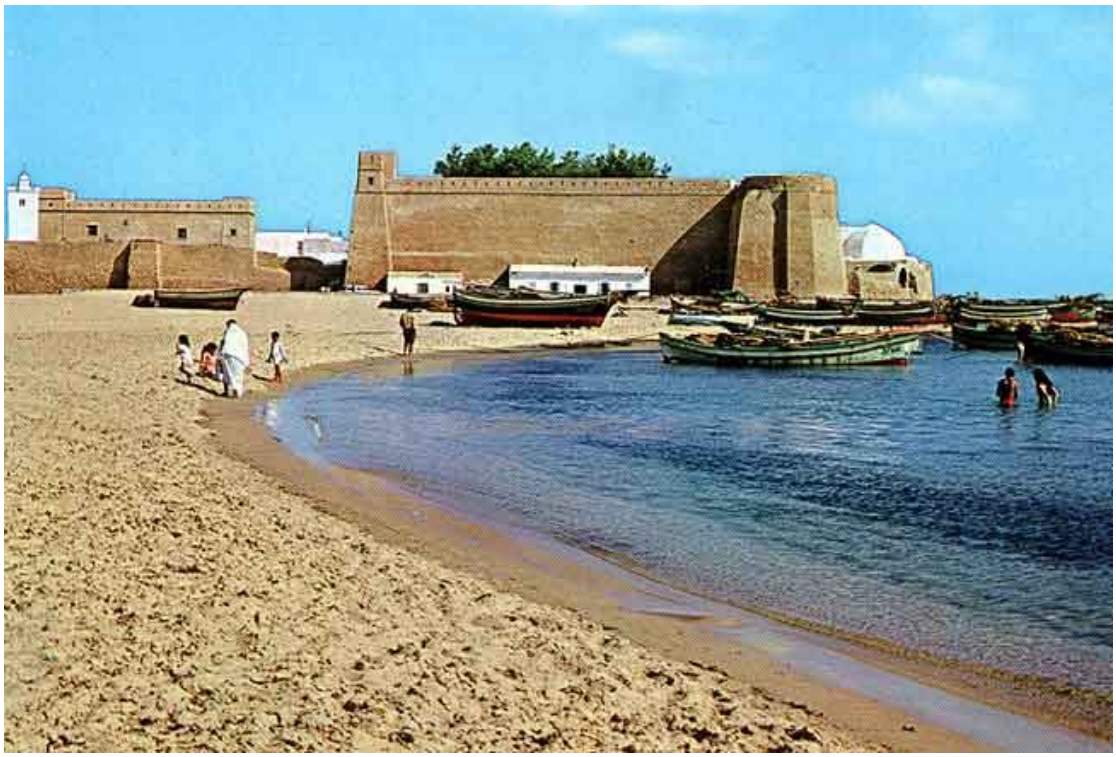
Random matrices and orthogonal polynomials

March 22 - 27, 2015

Hammamet-Tunisie



The workshop ``Random matrices and orthogonal polynomials "'s aim is to bring together researchers working in all fields of mathematics related to orthogonal polynomials and random matrices. In the past few years, orthogonal polynomials and random matrices have seen many new developments, and became related to many other areas of mathematics, in particular to growth models or to enumerative geometry. Courses will mainly focus on the relation of random matrices with orthogonal polynomials but talks of the participants will cover a much broader list of topics.

ORGANIZING COMMITTEE:

M. J. Atia (university of Gabès, Tunisia), L. Khériji (university ElManar, Tunisia) and H. Chaggara, University of Sousse, Tunisia.

INVITED SPEAKERS FOR COURSES:

- A. Kuijlaars (Katholieke Universiteit Leuven)
- A. Fitouhi, Tunis university, Tunisia
- Jacques Faraut (Université Pierre et Marie Curie, Paris, France)
- Gernot Akemann (Bielfeld university, Germany)
- Mikhail Tyaglov (Shanghai Jiao Tong University, China)
- Maurice Duits (Royal Institute of Technology (KTH) Stockholm, Sweden)
- Oleg Zaboronski (university of Warwick, England)
- Lotfi Khériji (university ElManar Tunisia)
- Manoubi Mejri (university ElManar Tunisia)
- Faouzi Thabet (university of Gabès, Tunisia)

VENUE

The conference takes place in El Mouradi Menzeh Hotel (5 stars), Yasmine Hammamet.

Arrival on Sunday (March 22) from 3pm.
Departure on Friday (March, 27) at 13 pm.
Start of lectures on Monday (March 5) morning.

Airport:
The hotel is located 80 km away from Tunis-Cartage Airport and 40 km away from Enfidha airport. You may also come through Monastir airport (but not very recommended).

Transportation to the Hotel:
The standard way to move from Tunis-Carthage airport to Hammamet is the following:
1. Take a taxi from the airport to the main train station.
2. Take the train to B. BOU REKBA. The website of the SNCFT for timetable of trains.
3. Take once again another taxi from Bir-Bouregba.to the hotel.
However, we do not recommend this option. We plan to organize common taxis from the Airport to the hotel.
The single way costs around 40 Euros, which can be shared among travelers.
So, please have in mind to send us the exact time of your arrival as soon as you can, so that we can schedule common Taxis.
This option is also valid for people coming through Enfidha Airport.

SOCIAL PROGRAM:

We plan to visit Dougga.

REGISTRATION FEES

The workshop fees are fixed for 25 Euros for master and phd students and 50 Euros for all others.

The workshop fees and full board hotel for Tunisien participants are fixed for 450 TND (in a DOUBLE ROOM).

All participants (except the INVITED SPEAKERS) must pay the registration fees prior to arrival at the workshop venue.

The workshop registration fees includes the courses, Conference Badge, workshop bag and conference accessories, workshop documents, Certificate, Coffee breaks and the social program (excursion).

ACCOMODATION:

All the lectures and activities of the conference will take place in the hotel, we have negotiated a good price for all participants:

- Chambre Double en **Pension Complète** inclus ½ eau durant les repas : **65 DT**/pax/nuit.
- Supplément Single : **22 DT**/nuit.
- Réduction 3ème lit adulte : 20%.
- Réduction enfants (02-12 ans) : 50% avec deux adultes.

You shall pay the hotel upon arrival and this will not be handled by the organizers of the conference, but by an independent travel agency.
One could contact

mondher.neji@gmail.com

for accommodation. (1 Euro=2.25 Dinars)

REGISTRATION

For registration, please send an email to
jalel.atia@gmail.com
indicating Name, family name, institution, phd or post-doc or faculty, arrival day and departure day, if you need an invitation letter etc…..

SCHEDULE

Schedule	Monday	Tuesday	Wednesday	Thursday	Friday
8h:30-9h:30	Fitouhi	Akemann	Kuijlaars	Tyaglov	Kuijlaars
9h:30-10h:30	Kuijlaars	Duits	Akemann	Duits	Akemann
10h:30-11h:30	break	break	break	break	break
11h:30-12h:30	Faraut	Zaboronski	Thabet	Faraut	Mejri
13h -15h	lunch	lunch	lunch	lunch	Lunch
15h -16h	Tyaglov	Kheriji	excursion	Zaboronski	
16h -17h	Poster session	Poster session		Poster session	

TITLES AND SUMMARIES OF LECTURES

Arno Kuijlaars's lecture(s) on:

Determinantal Point Processes and Multiple Orthogonal Polynomials.

The outline of the lectures is

1) Determinantal point processes and orthogonal polynomials on
the real line, examples from random matrix theory, GUE and LUE

2) Multiple orthogonal polynomials and MOP ensembles,
examples from random matrices and non-intersecting paths.
Overview of scaling limits.

3) Singular values of products of Ginibre random matrices,
Meijer G-functions, integral representations and scaling limit.

Jacques Faraut's lecture(s) on:

Logarithmic potential theory, orthogonal polynomials,
and random matrices.

Summary:

We will start with a classical result in logarithmic potential theory
about the equilibrium measure. As a first application we will describe the
asymptotic distribution of the zeros of classical polynomials.
A second application will be given to the asymptotic distribution
of the eigenvalues of random matrices. In particular we will study
the probability, for a real symmetric or Hermitian matrix,
to be positive definite, and the asymptotic distribution
of the Sylvester index of inertia.

Oleg Zaboronski 's lecture(s) on:

Matrix valued Brownian motions and interacting particle systems

1. Pfaffian point process for the real Ginibre ensemble and annihilating Brownian motions
2. Multi-time correlation functions for the real Ginibre ensemble
3. Large deviations results for the real Ginibre ensemble from the interacting particle systems.
4. Asymptotically exact itnegrals over symmetric spaces and non-invariant random matrix ensembles

Gernot Akemann's lecture(s) on:

Orthogonal polynomials in the complex plane and non-hermitian random matrices

Summary:

The aim is to explain the use of orthogonal polynomials in the complex
plane in describing spectral correlations of finite and large random
matrices which are not self adjoint. Focussing mainly on complex matrix
elements I will start with the joint density of complex eigenvalues as a
determinantal point process. The Dyson-Mehta Theorem will be used to

compute all density correlation functions of these, with non-trivial examples given by Hermite and Laguerre polynomials on C. In the last part I will come to recent results on the complex eigenvalues of products of random matrices. This includes the computation of Lyapunov exponents and their relation to the singular values.

Ahmed Fitouhi 's lecture on

In this talk we show that the orthogonal polynomials such that Jacobi polynomials plays a crucial role in resolution of the wave equations for singular operator and similarly this can be extend to quantum calculus.

Mikhail tyaglov's lecture on

Title: Algebraic aspects of orthogonal polynomials and applications.

Abstract: The talks concern some algebraic aspects of orthogonal polynomials. Namely, we discuss the role of various structured matrices (Hankel, Toeplitz, Vandermond, Hurwitz, Hesenberg) in the theory of orthogonal polynomials. In particular, we discuss the cases when such matrices lead to new classes of orthogonal polynomials.

SPONSORS

UNIVERSITÉ DE GABÈS
University of Gabes جامعة قابس

UR11ES87 unité de recherché Mathématiques et applications FSG, Tunisie	**Laboratoire Analyse harmonique et fonctions spéciales. FST Tunisie**

Representations of Lie Groups and Special Functions

PARTICIPANTS

1- Mohamed Jalel Atia, Gabès University, Tunisia
2- Lotfi Khériji, ElManar University, Tunisia
3- Ahmed Fitouhi, Elmanar University, Tunisia
4- Arno Kuijlaars (Katholieke Universiteit Leuven)
5- Jacques Faraut (Université Pierre et Marie Curie, Paris, France)
6- Gernot Akemann (Bielfeld university, Germany)
7- Mikhail Tyaglov, Shanghai Jiao Tong University, China
8- Maurice Duits, Stockholm University, Sweden
9- Lamine Bouzettouta, Skikda University, Algeria
10- Oleg Zaboronski, university of Warwick, England
11- Imed Ben Salha, Monastir university, Tunisia
12- Lamaa Khaled, Gabès University, Tunisia
13- Faouzi Thabet, Gabès University, Tunisia
14- Mohamed Ihsen Tounsi, Gabès University, Tunisia
15- Zouhaier Raddawi, Gabès University, Tunisia
16- Mondher Chouikhi, Gabès University, Tunisia
17- Mannoubi Mejri, Gabès University-ElManar University, Tunisia
18- Issameddine Bouguerra, Gabès University, Tunisia
19- Imed Laamiri, university of Sousse, Tunisia
20- Boucenna Ahcen,Skikda University, Algeria
21- Lallouche abdallah,Skikda University, Algeria
22- Atef Alaya, Umm ElQura university, KSA
23- Mohamed Bouali, Umm ElQura university, KSA
24- Ahmed Saoudi, université de Tunis El Manar
25- Bel hadj ali Belkis, University el Manar, Tunisia.
26- Lazhar Dhaouadi, University el Manar, Tunisia.
27- Hamza Chaggara, University of Sousse, Tunisia
28- Neila Chaggara Ben Romdhane, University of Sousse, Tunisia
29- Mabrouk Sghaier, Gabès University, Tunisia
30- Athar Bouanani, Gabès University, Tunisia
31- Faiza Fourati, Gabès University, Tunisia
32- OUNI ABDELWAHEB, INSTITUT PRÉPARATOIRE AUX ÉTUDES D'INGÉNIEURS DE MONASTIR
33- KamelBrahim, , Elmanar University, Tunisia
34- Slim Bouaziz, Elmanar University, Tunisia
35- ChefaiSoumaya, Elmanar University, Tunisia
36- Nefzi Bochra, Elmanar University, Tunisia
37- Hleili Manel, Elmanar University, Tunisia
38- Meniar Hadded, Elmanar University, Tunisia

39- Wafa Binous, Elmanar University, Tunisia
40- Taf Sabrina, Elmanar University, Tunisia
41- Riahi Latifa, Elmanar University, Tunisia
42- HanenBen Mansour, Elmanar University, Tunisia
43- Sami Kouki, Elmanar University, Tunisia
44- Anis Bseissa, Elmanar University, Tunisia
45- Adel Hamdi, Gabès University, Tunisia
46- Wafa Karou, Gabès University, Tunisia
47- Amel Saka, Gabès University, Tunisia
48- Yahia Habbachi, Gabès University, Tunisia
49- Abderrazek Ilahi, Gabès University, Tunisia
50- Noureddine Ghiloufi, Gabès University, Tunisia
51- Haithem Hawari, Gabès University, Tunisia
52- Mohamed Zaway, Gabès University, Tunisia
53- Jawher Hbil, Gabès University, Tunisia
54- Anouar Ben Mabrouk : ISSAT Sousse & Computational Math Lab, FSM
55- Mohamed Lakdar Ben Mohamed : ISSAT Sousse & Comp Math Lab FSM
56- Sabrine Arfaoui : Fac Sci Monastir
57- Imen Rezgui : Fac Sci Monastir