

Hatem NAJAR

Curriculum Vitae

College of Sciences, Monastir, 5000
Tunisia

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Education

- 1992–1994 **Under Graduate Diploma in Mathematical Physics**, *Faculty of Sciences in Tunis*, very good scores upon graduation,
- 1994–196 **Graduate Diploma in Mathematical Sciences**, *Faculty of Sciences in Tunis*, , good scores upon graduation
- 1996–1997 **Master Degree in Mathematical Sciences**, *University of Paris 13*, Paris, good scores upon graduation

Ph. D thesis: 1997-2000, University of Paris 13, France.

- Title *Lifshitz asymptotic for random acoustic operators*
- supervisor F. Klopp
- Jury B. Helffer (University Paris 11 (France)), A. Grigis (University Paris 13 (France)), W-M Wang (Ecole polytechnique (France)), J-C Guillot (University of Paris 13 (France)), L. Pastur (referee, University Paris 7 (France)), P. Stollmann (referee, Chemnitz university (Germany))

Habilitation: 2007, University of Sfax, Tunisia.

- Title *Some results on the spectral theory of partial differential operators with random coefficient*
- Jury W. Kirsch (referee) M. Selmi (referee), A. Baklouti, M. Ben Ammar, M. Ben Ayed, M. Menif, F. Ammar.

Research interest:

- Spectral Theory.
- Partial Differential Equations.
- Random Schrödinger operators.
- Quantum waveguide.
- Graph theory.

Publications in Refereed Journals:

1. H. Najjar: *Asymptotique de la densité d'états intégrée des opérateurs acoustiques aléatoires*. C. R. Acad. Sci. Paris, **333** I, p 191-194 (2001)
2. H. Najjar: *Lifshitz tails for random acoustic operators*. Jour. Math. Phys. **44** N ° 4 (2003) p 1842-1867.
3. H. Najjar: *Asymptotic behavior of the integrated density of states of acoustic operators with random long range perturbations*. Jour. Stat. Phys. 115, no. 3-4, p 977-996 (2004).
4. H. Najjar: *The spectrum minimum for random Schrödinger operators with indefinite sign potentials*. Jour. Math. Phys. 47 (2006), no. 1
5. H. Najjar: *2-Dimensional localization of acoustic waves in random perturbation of periodic media*. Jour. Math. Anal. Appl. 322 (2006), no. 1, p 1-17.
6. H. Najjar: *Internal Lifshitz tails for discrete Schrödinger operators*. Inter. Jour. Math. Math. Sci (2006).
7. H. Najjar: *Results dealing with the behavior of the integrated density of states of random divergence operators*. C. R. Acad. Sci. Ser I (**344**) p 367-372; (2007).
8. H. Najjar: *Lifshitz tails for acoustic waves in random quantum waveguide*. Jour. Stat. Phys. Vol 128 No 4, p 1093-1112 (2007).
9. H. Najjar: *Non-Lifshitz tails at the spectrum bottom of some random operators*. Jour. Stat. Phys. (2008).
10. H. Najjar, S. Ben Hariz, M. Ben Salah *On the Discrete Spectrum of a Spatial Quantum Waveguide with a Disc Window* Mathematical Physics, Analysis and Geometry (2009)
11. M. Marx, H. Najjar: *On the singular spectrum for adiabatic quasi-periodic Schrödinger Operators* Advances in Mathematical Physics Vol. 2010, Article ID 145436, 30 pages (2010). doi:10.1155/2010/145436
12. H. Najjar, O. Olendski: *Localization properties of Dirichlet spatial quantum waveguide with two concentric Neumann disc windows* J. Phys. A: Math. Theor. **44** (2011) 305304 doi:10.1088/1751-8113/44/30/305304
13. W. Kirsch, H. Najjar: *Lifshitz tails for continuous Laplacian in the site percolation case* Random Operators and Stochastic Equations. Volume 22, Issue 2, Pages 109–117 (2014).
14. H. Najjar, M. Raissi: *A quantum waveguide with Aharonov-Bohm field*. Math. Meth. App. Sciences (2015).
15. H. Boumaza, H. Najjar: *Lifshitz Tails For Continuous Matrix-valued Anderson Models* J. Stat. Phys. 160(2), p 371-396. (2015).
16. H. Najjar and M. Raissi: *Eigenvalues asymptotics for Stark operators under various boundary conditions*, Accepted in Com. App. Ana. (2018).
17. H. Najjar: *Lifshitz Tails for Quantum Waveguides with Random Boundary Conditions*. Math Phys Anal Geom 22, 17 (2019) doi:10.1007/s11040-019-9314-8.
18. H. Najjar and M. Zahri: *Stark operators on finite intervals: Self-adjointness and spectrum* submitted.
19. R. Gargouri, H. Najjar: *A remark on the characterization of triangulated graphs*. Submitted.
20. H. Najjar, I. Y. Popov, A. S. Bagmutov, I. F. Melikhov: *On the discrete spectrum of quantum layers with Neumann windows in the presence of external electric field*. Work in progress.

Conference Proceedings

- H. Najjar: *Asymptotique de la densité d'états intégrée des opérateurs acoustiques aléatoires*. p 102-111 First Franco-Tunisien days in PDE, By B. Dahmen C. Zouili, J. Lebau (2001).
- H. Najjar *Spectral properties of a quantum waveguide with Neumann Window* Spectral and Scattering Theory and Related Topics : Edited by Takuya Mine, p 82-102, ISSN 1880-2818 N 6 (2014). <http://hdl.handle.net/2433/223034>
- H. Najjar *Spectral results on Quantum waveguide* Advances in Applied Mathematics: International Conference on Advances in Applied Mathematics (ICAAM) 2013 Edited by A. Jeribi. Springer (2015).
- H. najjar *Introduction to Spectral Theory of Unbounded Operators, by H. Najjar* p1-34. Spectral Theory on Graphs and Manifolds, the CIMPA Research SMF; Seminaires et Congres Volume: 32; 2018 Edited by C. Anné: Laboratoire de Mathématiques Jean Leray, Nantes, France, N. Toriki-Hamza.
- Igor Y. Popov, Alexander S. Bagmutov, Ivan F. Melikhov, and Hatem Najjar *Numerical analysis of multi-particle states in coupled nano-layers in electric field* AIP Conference Proceedings 2293, 360006 (2020); <https://doi.org/10.1063/5.0026539>

Communication in international conferences

- First Franco-Tunisian days in PDE, Marsa, Tunisia 2001.
- Mediterranean Days in Mathematics and applications, Mars 2005, Tozeur; Tunisia.
- Stochastic Process in Mathematical Physics" **New York University** , Juin 2006.
- First and second spectral theory days in Sfax, Tunisia (2006-07, Sfax)
- Disordered Systems: Random Schrödinger Operators and Random Matrices, Mars 2008 Oberwolfach, Germany.
- Mathematics and Physics of Anderson Localization, July 2008, **Cambridge university**, United Kingdom.
- Quantum mathematics for disordered system. Universitit Paris 6-Paris 13, 28-30 May 2012.
- Mathematical Physics of Disordered Systems 13-17 May, 2013 Fer. Uni. Hagen, Germany.
- Spectra and Graphs, Jun 2013 Bizerte, Tunisia.
- Spectra of Random Operators and Related Topics Research Institute In Mathematical Sciences **Kyoto University, Japan**. 5-7 December 2013.
- Spectral and Scattering Theory and Related Topics: Research Institute In Mathematical Sciences **Kyoto University, Japan**. 11-13 December 2013.
- International conference on Advances in Applied Mathematics, Hammamet, Tunisia, 18-22 December 2013.
- Spectra and Graphs, Jun 2014 Bizerte, Tunisia.
- International Mathematical Center of Pur and Applied Mathematics (CIMPA) Spectral theory of graphs and manifolds, Kairouan Tunisia, 7-19 November 2016. <http://www.math.sciences.univ-nantes.fr/cimpa16kairouan/sites/www.math.sciences.univ-nantes.prive.cimpa16kairouan/files/affiche.pdf>
- Mathematical Challenge of Quantum Transport in Nanosystems "Pierre Duclos Workshop"ITMO University, Saint Petersburg, Russia (September 14-16, 2020)

Invitations in Mathematical departments

- University of Bochum, (Germany) Mars 2007.
- University of Hagen, (Germany) January 2010, 2012.
- University of Paris 13, (France) 2004, 2006, 2010.
- Maine University, (France) 2008, 2012.
- Center of Theoretical Physics, Marseille, (France) 2008, 2010, 2012, 2014.
- Kyoto University, (Japan) December 2013.
- University of Chemnitz, (Germany), December 2014.

Supervision

- Master thesis: Mr Dhafer Hadj Dahmen Title: Spectral theorem for Self-adjoint operators and applications Jury: E. Bouassida (F.S. Sfax), H. Najjar (I.P.E.I. Monastir), M. Ben Ammar (F.S. Sfax), M. Damak (F.S. Sfax), M. Menif (F.S. Sfax) (2007).
- Master thesis: Mr Mohsen Miraoui. Title: Spectral properties of quantum waveguide. Jury: A. Jeribi (F.S. Sfax) M. Ben Ammar (F.S. Sfax) M. Menif (F.S.Sfax). (2009)
- Master thesis: Mlle Monia Raissi. Title: Spectral studies for a quantum waveguide in the presence of external electric field. Jury members: M. Damak (F.S. Sfax) M. Menif (F.S. Sfax) H. Jerbi (F.S. Sfax) (2011)
- Master thesis: Mlle Hiba Hammadi. Title: "Spectral properties of twisted quantum waveguides". Jury members: M. Damak (F.S. Sfax) M. Menif (F.S. Sfax) H. Jerbi (F.S. Sfax) (2011)
- Supervising Master thesis : Khemily yousef. Title: Spectral theory for Quantum Graphs. Jury members: K. Ammari (F.S. Monastir), N. Turki (ISIG Kairouan). (2014)
- Supervising Ph. D.: Monia raissi. Title: Spectrum of a Quantum waveguide with Magnetic field . Defended on 11 th November 2016.

Teaching courses

- **Undergraduate courses:** Probability, Algebra , Linear Algebra, Calculus I,II,III, Discrete Mathematics.
- **Graduate courses:** Mathematics for Engineering, Topologies, Probability theory, Analysis II.
- **Master courses:** Hilbert and spectral analysis, Spectral theory of bounded and unbounded operators, convex functions and optimization, Functional Analysis, Sobolev Spaces.

Administrative Responsibility

- 2002-2007 **Member**, *Exam commission of the national Engendering Schools*
- 2004-2007 **Member**, *Scientific Council*, Higher Institute of Engineering , University of Monastir
- 2007-2008 **Member**, *Scientific Council*, Higher Institute of Applied Mathematic and Informatics, University of Kairouan
- 2007-2009 **Head** , *Organizing and scientific organizing committees for Internationals Mathematical days in University of Kairouan*
- 2011 **Head**, *organizing and scientific committees for the summer school in Quantum Transport and related Problems Mathematical Physics*
- 2007-2011 **President**, *the Master degree commission in Higher Institute of Applied Mathematic and Informatics, University of Kairouan*
- 2009 **Co-organizer**, *Spectral theory of PDE Session* , in SMT Tunisian-France conference
- 2007-2012 **President** , *Quality Assurance and Accreditation commission at University of Kairouan*

- 2008-2012 **Vice President of University of Kairouan,**
- 2015 **President,** *Commission for Employment and Skills in Mathematics at University of Monastir*
- 2016 **Membre,** *National commission for employment and promotion in Mathematics for Associate Professor Degree.*

Professional Society Memberships

- 2008-Present **Reviewer,** *Math reviews*
- 2010-Present **Member,** *Editor board, American Journal of Mathematics and Sciences*
- 2008-Present **Member,** *IAMP, International Association of Mathematical Physics,*
- 2002-Present **Member,** *SMT, Mathematical Tunisian Society ,*
- 2007-Present **Member,** *AMA, Association of Mathematics and Application, Tunisia ,*

Projects Management

- Research Projects:
 - 2005-2008: Grants for DGRSRT-CNRS Project between Tunisia and France N 06/R 15-04. Subject: Spectral Theory for Random Operators.
 - 2008-2011: Grants for Tunisian-French Conjoint Project CMCU N 09/G1504. Subject : Spectral Theory for Partial Differential Equations.
 - 2011-2014: Grants for DGRSRT-CNRS Project between Tunisia and France N 12/R 15-01. Subject: Transport and spectral theory in quantum waveguides.
- Administrative and European projects:
 - TEMPUS Project: TIES: Towards an internationalization of Higher Education Network for MEDA region .
 - TEMPUS Project: QUALYCERT: Quality Assurance and Certification at University.
 - TEMPUS Project: EOLES: Electronic and Optic E-learning for Embedded Systems.
 - TEMPUS Project: OSMOSE: Ouverture Structurée Université Monde Socio-Economique.

Computer Skills

Lunix, Windows, Tex, Latex, Word, Excel, Matlab and Maple.

Language

Arabic (native language), French and English.

Other Skills

- Trained in internal evaluation of universities, by Dresden University, Germany.
- Trained in external evaluation of universities, by Dresden University, Germany.