

CURRICULUM VITAE

Hichem HAJAIEJ

New York University/ Shanghai
Room 1143, 1555 Century Avenue
200122 Shanghai
Pudong, China
Email: hh62@nyu.edu
Tel: +86 021 205 951 09
Web Site: hichem-hajaiej.com

Education

2006 : Habilitation : Faculty of Sciences of Tunis

1998-2001 : Ph.D. in Mathematics : The Swiss Federal Institute of Technology, Lausanne (**EPFL**) **Title of the thesis :** Inégalités de symétrisation et applications **Advisor :** Professor C.A Stuart

1996-1998 : Master of Science with a major in Mathematics :
EPFL, University of Lausanne, University of Geneva

1994-1996 : Bachelor of Science with a major in Mathematics :
Faculty of Sciences of Tunis

1992-1994: : Diploma of High Studies in Mathematics and Physics :
Faculty of Sciences of Tunis

Scientific Career

2014-2015 : Visiting Associate Professor : New York University Shanghai

2010-2014 : Associate Professor : King Saud University

2010- : Associate Professor : Engineering School of Tunis (IPEIT)

2007-2009 : Postdoc : University of Giessen, University of Zürich

2005-2010 : Assistant Professor : Engineering School of Tunis (IPEIT)

2003-2004 : Research Associate : Department of Mathematics,
University of Virginia (USA)

2002-2003 : A. Professor : Department of Mathematics, EPFL

2001-2002 : Senior Assistant : Department of Mathematics, EPFL

1997-2001 : Research and Teaching Assistant : Department of Mathematics, EPFL

Honors and Awards

Principal Investigator of the Research Group VPP124,
(600.000) SAR (2011-2014)

Principal Investigator of the NPST Project,
Applied Partial Differential Equations (1.200.000 SAR). (2013-2013)

Principal Investigator of the NPST Project,
Qualitative Analysis and applications for semi-linear
elliptic equations (1.400.000 SAR), (2012-1014)

Principal Investigator of the NPST Project,
Fractional Calculus and Applications in Real World
Life (1.200.000 SAR). (2011-2013)

Humboldt Foundation (Germany) , (June 2007- January 2009),
University of Giessen

Fonds National Suisse de la Recherche Scientifique, (Zürich, Switzerland) (September
2006- March 2007), University of Zürich

Fonds National Suisse de la Recherche Scientifique,
(January 2004- December 2004), University of Virginia

Scientific Activities (Last 3 years)

[1] Organization of Conferences:

2015: (1-3 May):New Developments and Insights in non-local and non-linear analysis
(co-organized with Fanghua Lin) New York University, Shanghai

2014: (4-7 May):New Trends in Nonlinear Schrödinger Equations, KSU

2013: (20-24 Nov):New Trends in Modern Analysis, Probabilistic and Analytic Methods
(co-organized with A. Ben Amor, N. Belhadj Rhouma, M. Selmi)

[2] Talks in Conferences:

2015:

-Nonlinear Dispersive Wave Equations (ICIAM 2015)

2013:

-International Conference on Mathematical Sciences and Engineering (Dec 24-25)
related problems, Jul 1-5)

-The first Workshop on fractional calculus and its applications (Apr 25-26)

-International Conference on Mathematical Sciences and Engineering (Feb 14-15)

[3] Scientific Visits:

Summer 2015:

-King AbduAllah University of Science and Technology (KAUST)

2014- 2015:

-New York University, Shanghai

Summer 2014

-KAUST

Summer 2013:

-Wolfgang Pauli Institute, Vienna (2 weeks)

-University of Hamburg (1 week)

[4] Synergistic Activities:

Editorial Board Member:

-Fractional Differential Calculus

Referee:

-Mathematical Models and Methods in Applied Sciences (M3AS)

-Michigan Journal of Mathematics

-Nonlinearity

-Journal of Mathematical Physics

-Annales Henri Poincaré, Differential Integral Equations

-Journal of Inequalities and Applications

-Arab Journal of Mathematical Sciences

-Journal of Mathematical Analysis and Applications

-Communications in Contemporary Mathematics

[5] Supervision of Students:

2014:

-PHd Faten Al Dossari (KSU)

-Postdoc Huyuan Chen (NYU, Shanghai)

2013:

-Master Thesis; Faten Al Dossary

Teaching Activities:

[1] New York University, Shanghai: (3 Hours weekly)

2014-2015:

-Calculus emphasizing proofs, calculus

-Analysis 2

[2] KSU: (12 Hours weekly)

2010-2014:

- Analysis 1, 2, Algebra 1, 2, Differential Equations,
- Functional Inequalities (Course for Master Students)

[3] *IPEIT: (6 Hours weekly)*

2005-2010:

- Analysis 1, 2 (Preparation of Students to International contests of 'Grandes Ecoles')

[4] *EPFL:*

1996-1998: (4 Hours weekly)

- Analysis 1, 2

1998-2001: (6 Hours weekly)

- Analysis 3, 4, Advanced Analysis (Graduate Course)

2001-2002: (5 Hours weekly)

- Analysis 3 (Instructor)

2002-2003: (4 Hours weekly)

- Spectral Analysis of Some Operators (Course for Master students)
- Functional Analysis (Course for graduate students)

List of Publications

- [1] Symmetrization inequalities for composition operators of Carathéodory type, **Proc. London. Math. Soc.**, 87(2003), 396-418. (with C. A. Stuart).
- [2] Extensions of the Hardy-Littlewood inequalities for Schwarz symmetrization, **International Journal of Mathematics and Mathematical Sciences**, 59 (2004), 3129-3150 (with C. A. Stuart).
- [3] Existence and non-existence of Schwarz symmetric ground states for elliptic eigenvalue problems, **Annali de Matematica Pura ed Applicata**, Volume 184, Number 3, (2005), 297 -314 (with C.A.Stuart).
- [4] On the variational approach to the stability of standing waves for the nonlinear Schrödinger equation, **Adv Nonlinear Studies**, 4 (2004), 469-501 (with C.A Stuart).
- [5] Cases of equality and strict inequality in the extended Hardy-Littlewood inequalities, **Proc. Royal. Soc. Edinburgh**, 135 A, (2005), 643-661.
- [6] Extended Hardy-Littlewood inequalities and some applications, **Trans. Amer. Math. Soc.**, vol. 357, no. 12, (2005) pp. 4885-4896.

- [7] Rearrangement inequalities for functionals with monotone integrals, **Journal of Functional Analysis**, 233, (2006), 561-582 (with A. Burchard).
- [8] Uniqueness and Characterization of the maximizers of some integral functionals, **Adv Nonlinear Studies**, 9, (2009), 215-226 (with C. Draghici).
- [9] Symmetric ground states solutions of m-coupled nonlinear Schrödinger equations, **Nonlinear Analysis: Methods, Theory and Applications**, Vol 71, 2, (2009).
- [10] Explicit approximation to symmetrization via iterated polarizations, **Journal of Convex Analysis**, Vol 17, N2, (2010).
- [11] Balls are the maximizers of the Riesz type integrals with supermodular integrands, **Annali de Matematica Pura ed Applicata**, Volume 189, Issue 3 (2010), 395-403.
- [12] Rearrangement Inequalities in the Discrete setting and some Applications, **Nonlinear Analysis: Theory Methods and Applications** 59 (2010), 1140-1148.
- [13] On the necessity of the assumptions used to prove generalized Hardy-Littlewood and Riesz type rearrangement inequalities, **Archiv der Mathematik** vol 96, Number 3, 273-280, 2011.
- [14] Fractional Gagliardo-Nirenberg and Hardy Inequalities under Lorentz Norms. **J. Math. Anal. Appl.** 396(2), 569-577 2012 (with Z. Zhichun and X. Yu).
- [15] On Schrödinger Systems arising in nonlinear optics and quantum mechanics - Part I. **MA3S**, vol 22, issue 7, 1-27, 2012.
- [16] On Schrödinger Systems Arising in Nonlinear Optics And Quantum Mechanics Part II, **Nonlinearity** 26, Number 4, 2013.
- [17] Quantitative stability estimates of the Hardy-Littlewood functional under constraints, **Journal of Nonlinear and Convex Analysis**, Vol13, number2, 273-279, 2012.
- [18] A weak-strong convergence property and symmetry of minimizers of constrained variational problems in \mathbb{R}^N . **Journal of Mathematical Analysis and Application**. Vol 389, Number 2 915-931, 2012. (with S. Kroemer).
- [19] Existence and uniqueness of maximizers of a class of functionals under constraints: Optimal conditions, **Journal of Inequalities and Applications** 2012 Issue1.
- [20] Characterization of maximizers via mass transportation techniques, **Journal of Optimization Theory and Applications**. Vol155, N 2, November 2012.
- [21] Orbital stability of l-Coupled nonlinear Schrödinger equations, **Communications in Contemporary Mathematics**, Volume 14, Issue 06, December 2012.
- [22] Necessary and sufficient conditions for the fractional Gagliardo–Nirenberg inequalities and applications to Navier-Stokes and generalized boson equations, **RIMS Kokyuroku Bessatsu**, B26 (2011), 159–199 (with L. Molinet, T. Ozawa, B. Wang).

- [23] Existence of minimizers of functional involving the fractional gradient in the absence of compactness, symmetry and monotonicity, **Journal of Mathematical Analysis and Applications**, Vol. 399, No. 1. (March 2013), pp. 17-26.
- [24] On the optimality of the conditions used to prove the symmetry of the minimizers of some fractional constrained variational problems, **Annales de l'Institut Henri Poincaré**, Volume 14, Issue 5 (2013), Page 1425-1433.
- [25] On the Cauchy problem of fractional Schrödinger equation with Hartree type nonlinearity, **Funkcialaj Ekvacioj**, volume 56 no 2, 2013, p. 193-224 (with Y. Cho, G. Hwang and T. Ozawa).
- [26] Characterization of the orbit of Standing waves of Hartree type equations with external Coulomb Potential, **Asymtotic Analysis**, 87 (2014) 57-64.
- [27] On the Xfel Schrödinger equation: Highly oscillatory magnetic potentials and time averaging, **Archive for Rational Mechanics and Analysis**, Volume 211, Issue 3, pp 711-732 (2014), (with P. Antonelli, A. Athanoulissis and P. Markowich).
- [28] On the orbital stability of fractional Schrödinger equations, **Communications in Pure and Applied Anlysis** ,Volume13, Number 3 1267-1282, (2014) (with Y. Cho, G. Hwang and T. Ozawa).
- [29] Multi-Configuration Hartree Fock Theory for Pseudorelativistic systems: The Time Dependent Case, Vol 24, N 3 (2014), 599-626, **Mathematical Models and Methods in Applied Sciences** (with S. Trabelsi and P. Markowich).
- [30] Existence of Minimizers of a Class of Constrained Vectorial Variational Problems, Part1, **Milan Journal of Mathematics**, Volume 82, Issue 1(2014) Page 81-98. (with S. Trabelsi, P. Markowich).
- [31] Symmetry of minimizers of some fractional problems, **Accepted in Applicable Analysis**.
- [32] Orbital Stability of Standing Waves of Two-Component Bose-Einstein Condensates with internal Atomic Josephson Junnction. **Accepted in Journal of Mathematical Analysis and Applications**.
- [33] Variational Appraoch to the orbital Stability of Standing Waves in Bose-Einstein Condensates, **Accepted in Milan Journal of Mathematics** (with F. Hadj Selem, P Markowich S. Trabelsi).
- [34] Sharp embedding of Sobolev Spaces Involving General kernels and its applications, **Accepted in Annales Henri Poincaré**.
- [35] On the global Cauchy problem for non-linear Schrödinger equation with magnetic potential, **Preprint** (with N. Boussaid, S. Ibrahim, L. Michel).
- [36] On a new class of functional problems, **Preprint**.
- [37] Existence of Minimizers of a Class of Constrained Vectorial Variational Problems, Part2, **Preprint** (with P. Markowich, S. Trabelsi).
- [38] A Complete Study of the Lack of Compactness and existence Results of a Critical Nirenberg Equation via a Flatness hypothesis. Part1, **Preprint** (with W. Abdelhedi, H Chtioui).

- [39] A Complete Study of the Lack of Compactness and existence Results of a Critical Nirenberg Equation via a Flatness hypothesis, Part2, **Preprint** (with W. Abdelhedi, H Chtioui).
- [40] On the spin of Bose Einstein condensate in the presence of Ioffe-Pritchard Magnetic field, **Preprint**.
- [41] Existence, Uniqueness and Non-Existence of solutions for semilinear Elliptic equation involving measures concentrated on the boundaries, **Preprint** (with H. Chen).
- [42] Open FOAM computation of interacting wind turbine flows and control (I): free rotating case, **Preprint** (with G. Chen C. Gu, Philip J. Morris, Eric G. Paterson, A. Sergeev).
- [43] Orbital stability of standing waves of a class of fractional Schrödinger equations with general Hartree-type integrand, **Preprint** (with Y Cho, M.M Fall, S. Trabelsi, P. Markowich).
- [44] Complementary study of the standing wave solutions of the Gross-Pitaevskii equation in dipolar quantum gases (with R. Carles).

References

Professor Luis A Caffarelli, caffarel@math.utexas.edu, University of texas

Professor Peter Markowich, p.a.markowich@damtp.cam.ac.uk, Cambridge University

Professor Fanghua Lin, linf@cims.nyu.edu, New York Univerity

Professor Nader Masmoudi, masmoudi@cims.nyu.edu New York University

Professor Shi Jin, jin@math.wisc.edu, Wisconsin University

Professor Laurent Veron, laurent.veron@lmpt.univ-tours.fr, Tours

Professor Thierry Cazenave, thierry.cazenave@upmc.fr University, UPMC, Paris

Professor Gustavo Ponce, ponce@math.ucsb.edu, University of Santa Barbara

Professor Alexander Pankov, alexander.pankov@morgan.edu, MSU

Professor J-C. Noverraz, jean-claudenoverraz@edu-vd.ch, High Pedagogical School of Lausanne