

Yaron Hadad

CONTACT INFORMATION

Researcher
Department of Mathematics
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RESEARCH INTERESTS

Mathematical Physics and Applied Mathematics: the theory of relativity, mathematical consequences of Einstein's equations, conservation laws, anomalies of general relativity and physical implications of the theory; integrable systems, soliton theory and the inverse scattering transform, in particular its applications to physics and general relativity; electromagnetism and the problem of radiation-reaction, establishing new analytic solutions of different radiation-reaction models, study of the limits of validity of electromagnetism in high acceleration, establishing a new model for charged particles that include the particle's self-force; mathematical models of diet and nutrition

EDUCATION

Ph.D., Mathematics and Physics

Department of Mathematics, University of Arizona, Tucson, Arizona, U.S.A 2013

- Thesis Topic: *Integrable Nonlinear Relativistic Equations*
- Advisor: Prof. Vladimir E. Zakharov

B.A., Mathematics and Physics

Departments of Mathematics and Physics, Technion Institute of Technology, Haifa, Israel, 2006

- *cum laude*
- Graduation Project: *Variational approach for the derivation of finite-dimensional models of dissipative solitons*
- Advisor: Prof. Alexander Nepomnyaschy

PUBLICATIONS

- [1] Y. Hadad, L. Labun, J. Rafelski, N. Elkina, C. Klier, H. Ruhl.
"Effects of Radiation-Reaction in Relativistic Laser Acceleration"
Phys. Rev. D 82, 096012 (2010)
doi:10.1103/PhysRevD.82.096012
- [2] J. Rafelski, L. Labun, Y. Hadad
"Horizons of Strong Field Physics"
AIP Conf. Proc. 1228:39-53 (2010)
doi:10.1063/1.3426079
- [3] J. Rafelski, L. Labun, Y. Hadad, P. Chen
"Quantum Vacuum Structure and Cosmology"
Tenth Workshop on Non-Perturbative Quantum Chromodynamics at l'Institut Astrophysique de Paris June 8-12 (2009)

PAPERS IN PREPARATION

- [4] Y. Hadad and V. Zakharov
"Diagonal Spacetime Metrics and Stability of Gravitational Waves"
- [5] Y. Hadad
"Gravitational Solitons on Cylindrically Symmetric Diagonal Backgrounds"
- [6] Y. Hadad
"The Symmetric Chiral Field Equation"

AWARDS	The University of Arizona, Tucson, Arizona, U.S.A	
	<ul style="list-style-type: none"> • Daniel Bartlett Award, 2012 • Outstanding Graduate Teaching Assistant, Spring 2011 	
	Technion Institute of Technology, Haifa, Israel	
	<ul style="list-style-type: none"> • The Dean of the Mathematics Faculty list of honor, 2006 • The President of the Technion's list of honor, 2005 • The Dean of the Mathematics Faculty list of honor, 2004 	
	Israeli Defense Forces (I.D.F)	
	<ul style="list-style-type: none"> • Bakum's List of Honor for the development of the I.D.F's personnel assignment system, 2003 	
INVITED TALKS	The University of Arizona , Tucson, Arizona, U.S.A	
	<i>"Gravitational Solitons on Einstein-Rosen Metric"</i>	
	Recent progress of waves processes in nature	October 9, 2011
	Max Planck Institute and Ludwig-Maximilians-Universität , Frauenchiemsee, Germany	
<i>"Radiation and Acceleration"</i>		
The Annual Laboratory for Attosecond Physics Meeting	October 3, 2009	
TEACHING EXPERIENCE	The University of Arizona , Tucson, Arizona, U.S.A	
	SuperTA of Math 523A: Real Analysis (for PhD students)	Fall 2012
	T.A. of Math 254 : Ordinary Differential Equations	Fall 2011
	Instructor of Math 254: Ordinary Differential Equations	Summer II 2011
	Instructor of Math 223: Vector Calculus	Spring 2011
	T.A. for Math 488 / 588: Differential Geometry, General Relativity and Cosmology	Spring 2011
	Grader for Math 456 / 556: Applied Partial Differential Equations	Spring 2011
	Instructor of Math 223: Vector Calculus	Fall 2010
	SuperTA of Math 523A: Real Analysis (for PhD students)	Fall 2010
	Instructor of Math 129: Calculus II	Summer II 2010
	Instructor of Math 129: Calculus II	Spring 2010
	Instructor of Math 124 : Calculus	Spring 2009
	Instructor of Math 120R: Preparation for Calculus	Fall 2008
	Instructor of Math 110: College Algebra	Spring 2008
	Instructor of Math 110: College Algebra	Fall 2007
	Technion Institute of Technology , Haifa, Israel	
	T.A. of Math 104215: Complex Functions	Fall 2006
	Grader for Math 104270 : Analytical Methods in Partial Differential Equations	Fall 2006
	T.A. of Math 104192 : Introduction to Applied Mathematics	Fall 2005

PROFESSIONAL
EXPERIENCE

Department of Physics, **Ludwig-Maximilians-Universität**, Munich, Germany

Visiting Student Researcher

June - December 2009

- *On the problem of radiation-reaction and electromagnetic radiation in view of Kaluza-Klein like theories*
- Found a new analytic solution of the Landau-Lifshitz Equation, and studied its physical significance (see publications)
- Advisor: Prof. Johann Rafelski

Department of Mathematics, **The University of Arizona**, Tucson, Arizona, U.S.A

Research Tutorial Group Project

Fall 2008 - Spring 2009

- *Numerical solutions of the Einstein field equations*
- Developed a numerical solver for Einstein's Field Equation in MATLAB
- Advisor: Prof. Misha Stepanov

Department of Particle Physics and Astronomy, **Weizmann Institute of Science**, Rehovot, Israel

Student Researcher

Summer 2006

- *On the Z^0 composition in a mini black hole decay*
- Project was part of the preparations for the search of Supersymmetry with the ATLAS detector at CERN
- Studied numerically the composition of Z^0 bosons in mini black hole decays
- Advisor: Prof. Ehud Duchovni

CONFERENCES
AND WORKSHOPS

The University of Arizona, Tucson, Arizona, U.S.A

Incoming Students Integration Workshop

August 3-7, 2012

Mathematical Sciences Research Institute, Berkeley, California, U.S.A

Mathematical General Relativity

July 9-20, 2012

The University of Arizona, Tucson, Arizona, U.S.A

Recent progress of waves processes in nature

October 7-9, 2011

UCLA, Los Angeles, California, U.S.A

Supersymmetry Workshop in Mathematics and Physics

February 6-7, 2010

Max Planck Institute and **Ludwig-Maximilians-Universität**, Frauenchiemsee, Germany

The Annual Laboratory for Attosecond Physics Meeting

October 3-8, 2009

CERN, Geneva, Switzerland

The Annual Cosmo International Conference on Particle Physics and Cosmology

September 7-11, 2009

NONACADEMIC
PROFESSIONAL
EXPERIENCE

Nutrino, Barcelona, Spain and Tel-Aviv, Israel

Co-founder

2010-present

- Designer of a mathematical optimization algorithm for nutrition and health
- This platform provides a framework to conduct research on the effects of nutrition on our well-being.

Dr. Joseph Ben-Shoshan's Clinic, Tel-Aviv University and Sheba Medical Center,
Tel-Aviv, Israel

Programmer & assistant **2000-2006**

- Developed clinic's management software and website
- Hardware acquisition and technical support

Hidonet, Tel-Aviv, Israel

Head of Research & Development **2005**

- Design and program of a user adapting promotion website

Sal Interactive, Tel-Aviv, Israel

Head of Research & Development **2004-2005**

- Websites design and programming
- Software design and database administration

Graphipus Group, Tel-Aviv, Israel

Programmer **2003-2004**

- Programmer of the "Urban Voids" international design competition web-gallery, Van Alen Institute, New York City, New York, U.S.A
- Programmer of the "Parachute Pavilion" open design competition web-gallery, Van Alen Institute, New York City, New York, U.S.A
- Programmer of website for Ofer Kenya Safari Ltd., Mombasa, Kenya

Israeli Defense Forces

Military service (mandatory) **July 2000 - June 2003**

- Developer and designer of the personal assignment program of the I.D.F
- Adapted the SAS engine for an optimized assignment of military's personnel

Mescon Technologies, Ramat-Ahaya, Israel

Programmer and web developer **Summer 1997**

- Programmed an interactive software for demonstration purposes of products
- Developed and designed a website

SOFTWARE SKILLS Computer Programming:

- C, C++, Java, JavaScript, Pascal, Basic, PHP, GNU make, SQL, MySQL, Mathematica, MATLAB, Maple, HTML, Flash

Productivity Applications:

- T_EX (L_AT_EX, B_IB_TE_X, P_STricks), Lyx, Microsoft Office, iWork

Operating Systems:

- Apple OS X, Linux, Microsoft Windows family, and other UNIX variants

LANGUAGES

English and Hebrew - fluent; Spanish and German - advanced; Italian - basic

SERVICE

Recent contributor to Wikipedia.

- Contributions to articles on complex analysis, soliton theory, general relativity, electromagnetism, Lagrangian and Hamiltonian mechanics.