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Curriculum Vitae
Ira Wolfson

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IN BRIEF

A versatile physicist specializing in inflationary cosmology, with a diverse skill-set and working knowledge including particle physics, astrophysics and non-linear physics. Well versed in several operating paradigms: collaborative efforts and individual research, cross-disciplinary as well as highly specialized areas. full command of several computing languages and modalities. A broad work experience ranging from military command (IDF), through military and civilian R&D (Puzzle Projects Ltd.), to software architecture and prototyping (Intel Ltd.). **Unique problem solving approach and mathematical aptitude, in an all around great and friendly guy.**

EDUCATION

Doctor of Philosophy (Combined track), Physics, 2019
Ben Gurion University of the Negev, Beer Sheva, Israel
Supervisor: Prof. Ramy Brustein.
Title of dissertation:
"Numerical analysis of the Primordial Power Spectrum for inflationary Potentials"

Master of Science, Physics, 2016
Ben Gurion University of the Negev, Beer Sheva, Israel

Bachelor of Science, Physics & Mathematics
Hebrew University in Jerusalem Israel, 2011

LANGUAGES

Hebrew, English.

ARTICLES IN REFEREED JOURNALS

Cosmology

- **Wolfson, Ira**, and Brustein, Ramy. "Small field models with gravitational wave signature supported by CMB data." Plos One 13, no. 5 (2018).
- **Wolfson, Ira**, and Brustein, Ramy. "Likelihood analysis of small field polynomial models of inflation yielding a high Tensor-to-Scalar ratio." Plos One 14, no. 4 (2019).
- Ben-Dayan, Ido, Keating, Brian, Leon, David and **Wolfson, Ira**. "Constraints on Scalar and Tensor spectra from N_{eff}." Journal of Cosmology and Astroparticle Physics 2019, no. 06 (2019).
- **Wolfson, Ira** and Brustein, Ramy. "Small field models of inflation that predict a tensor-to-scalar ratio $r = 0.03$," Physical Review D 100, no. 4 (2019).
- **Wolfson, Ira**, Maleknejad, Azadeh, and Komatsu, Eiichiro. "How attractive is the isotropic attractor solution of axion-SU(2) inflation?" Journal of Cosmology and Astroparticle Physics 2020, no, 09 (2020).
- **Wolfson, Ira**, Maleknejad, Azadeh, Murata, Tomoaki, Komatsu, Eiichiro and Kobayashi, Tsutomu. "The isotropic attractor solution of axion-SU(2) inflation: universal isotropization in Bianchi type-I geometry" Journal of Cosmology and Astroparticle Physics 2021, no, 09 (2021).

Non-linear physics

- **Wolfson, Ira**, Ben-Abu, Yuval, Eshach, Haim and Yizhaq, Hezi. "Energy, Christiaan Huygens, and the Wonderful Cycloid—Theory versus Experiment." Symmetry 10, no. 4 (2018).

Statistical Mechanics

- **Wolfson, Ira**, Schramm, Netta R., Biton, Yoav Y. and Ben-Abu, Yuval. "The rain stick, a simple model for the dynamics of particles passing obstacles in a gravitational field." Physica A: Statistical Mechanics and Its Applications 528 (2019).

Outreach/Education

- Ben-Abu, Yuval, **Wolfson, Ira**, Baran, Gil, and Yizhaq, Hezi. "Downhill cycling symmetry breaking: how the rider foils experiment." Physics Education 52, no. 6 (2017).
- **Wolfson, Ira**, Ben-Abu, Yuval and Yizhaq, Hezi. "Finding the speed of a bicycle in circular motion by measuring the lean angle of the bicycle." Physics Education 53, no. 3 (2018).
- Ben-Abu, Yuval, Yizhaq, Hezi, Eshach, Haim and **Wolfson, Ira.** "Interweaving the Numerical Kinematic Symmetry Principles in School and Introductory University Physics Courses." Symmetry 11, no. 2 (2019).

SUBMITTED ARTICLES

NeuroScience

- Ben-Abu, Yuval, **Wolfson, Ira,** Cloake, Alex, Contera, Sonia, and Tucker, Stephen. "Non markovian rate process of TRP ion channel activity".

PRESENTATIONS & TALKS

Invited talks

- No-go areas in the Axion-SU(2) Chromo-Natural model, and the spectator model solution. Zooming in on Axions in the Early Universe. CERN (2020)

Conferences

- Advances in GW yielding small field models.
  Inflation, Alternatives and Gravitational Waves - Ariel University (2019)
- Small field models GW in theory and practice - disproving and reviving the theory.
  CMB from A to Z - Ecole de Luminy, Corsica (2017)
- Gravitational waves from small field models - preferred potentials for r=0.001
  COSMO17 APC,IAP -Paris (2017)
- How being fat can save your life
  Negev physics FETE 2017 (2017)
- Small field models and Gravitational waves - a numerical precursor
  CosPa 2016, University of Sydney Australia (2016)
- Symmetry for dummies
  Be'eroTed (2015)
- Physics of Water Polo and playing dirty
  Negev Physics FETE 2015 (2015).

Seminars

- Small field models with large tensor to scalar ratio - Numerical study
  Max-Planck-Institute for Astrophysics (2019).
- A disturbance in analytics
  Ben-Gurion University of the Negev (2019).
- Analytical failings in predicting CMB observables: The case for numerics.
  Lawrence Berkeley National Labs (2019).
- Small field models with significant GW signal
  University of California Los Angeles (2017)
- Small field models and Gravitational Waves.
  University of Melbourne (2016).
- Small field models with significant GW signal
  Universite de Geneve (2016)
- Ahead of the hunt - Leading small field inflationary potential.
  Ben Gurion University of the Negev (2016).

HONORS AND AWARDS

Minerva Post-Doctoral Fellowship, 2019-2020
Minerva Short-Term Research grant, 2018
CNRS travel grant, 2017,2018.
Physics department scholarship for PhD studies, 2014-2018
M.Sc. excellence scholarship 2011-2014
CET scholarship for young scientists 2010
HUJI excellence award for B.Sc. studies 2007

MEMBERSHIPS

Member of American Physics Society (APS),since 2018
Member of Israeli Physics Society (IPS), since 2016.

PROFESSIONAL EXPERIENCE

Minerva Post Doctoral Fellow — Max-Planck-Institute for Astrophysics, Karl-Schwarzschild-Str. 1, 85748 Garching, Germany — 2019-2020

PhD student — Ben Gurion University of the Negev, Beer Sheva, Israel — 2014-2019

Early universe cosmology: Small field inflationary models, Primordial Gravitational Waves, Primordial Black holes. (Adv. Ramy Brustein)

M.Sc. Student — Ben Gurion University of the Negev, Beer Sheva, Israel — 2012-2014

Numerical Cosmology: CMB analysis that includes scalar index running and running of running. B-mode analysis. (Adv. Ramy Brustein)

E2E solution prototyping professional — Intel Ltd., Jerusalem campus, Israel. — 2010-2013

Incorporating cutting edge technologies into new business solutions. Building prototype software suites, algorithms and automated tests.

B.Sc. Student — Hebrew University of Jerusalem, Jerusalem, Israel. — 2007-2011

Physics, Mathematics, with augmented Computer Science courses. Advanced seminars: 'Chaos and Non-Linear Physics' and 'Advanced Inequalities'.

Martial Arts student for internal chinese martial arts — Master Donald Rubbo, San Rafael, CA, USA. — 2007

Full time student of traditional chinese martial arts. Studying Kung Fu, Tai Chi, Xing Yi and Bagua with Master Donald Rubbo.

C4I project management — Puzzle Projects Ltd., Zichron Yaakov, Israel. — 2006-2007

Developing C4I (Control Command Communications, Computers & Intelligence) solutions for the security industry. Design, Prototyping, Development and operational acceptance tests.

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COMPUTER SKILLS

- Proficient programming skills in: Python, Fortran, Matlab, C#, Java,C++.
- Networking languages: HTML, PHP, JavaScript.
- Experience in working under Windows as well as Linux.

TEACHING EXPERIENCE

Teaching Assistant — Ben Gurion University of the Negev, Beer Sheva, Israel — 2014-2019

Advanced courses:

Particle Physics I
General Relativity
Astrophysics
Introduction to Particles and Fields

Multiple introductory courses, and courses for non-physicists.

Junior Lecturer — Sami Shamoon Academic College, Beer Sheva, Israel — 2018-2019

Courses:

Physics 2
Hands-on Matlab:
Scientific Computing.

SERVICE

Journal Review

- Article reviewer for Journal of Cosmology and Astroparticle Physics (2019).
- Article reviewer for Biophysical Chemistry (2020).

Community

- Yerucham young physicists' program "Physics for a future" (2013 - 2019). A scientific program aimed at disenfranchised high school students from the periphery. This program introduces "real" physics as opposed to textbook studies. We give students the chance to experience physical research along with top scientists and engineers. Thus, we promote both science as well as social mobility for these teenagers.

Other Noteworthy Activities and Skills

- 30 years student of martial arts, specifically: Traditional Chinese Martial Arts - Kung fu, Tai Chi, Xing Yi, Bagua.
- Trumpet playing, jazz and classical.