

# Curriculum Vitae

## Ira Wolfson

### CURRENT ADDRESS

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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).

#### 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).

## PRESENTATIONS & TALKS

### 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**

<b>Minerva Post Doctoral Fellow</b>	Max-Planck-Institute for Astrophysics Karl-Schwarzschild-Str. 1 85748 Garching, Germany	2019-2020
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<b>PhD student</b>	Ben Gurion University of the Negev Beer Sheva, Israel	2014-2019
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Early universe cosmology: Small field inflationary models, Primordial Gravitational Waves, Primordial Black holes. (Adv. Ramy Brustein)

<b>M.Sc. Student</b>	Ben Gurion University of the Negev Beer Sheva, Israel	2012-2014
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Numerical Cosmology: CMB analysis that includes scalar index running and running of running. B-mode analysis. (Adv. Ramy Brustein)

<b>E2E solution prototyping professional</b>	Intel Ltd. Jerusalem campus, Israel.	2010-2013
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Incorporating cutting edge technologies into new business solutions. Building prototype software suites, algorithms and automated tests.

<b>B.Sc. Student</b>	Hebrew University of Jerusalem Jerusalem, Israel.	2007-2011
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Physics, Mathematics, with augmented Computer Science courses. Advanced seminars: 'Chaos and Non-Linear Physics' and 'Advanced Inequalities'.

<b>Martial Arts student for internal chinese martial arts</b>	Master Donald Rubbo San Rafael, CA, USA.	2007
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Full time student of traditional chinese martial arts. Studying Kung Fu, Tai Chi, Xing Yi and Bagua with Master Donald Rubbo.

<b>C4I project management</b>	Puzzle Projects Ltd. Zichron Yaakov, Israel.	2006-2007
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Developing C4I (Control Command Communications, Computers & Intelligence) solutions for the security industry. Design, Prototyping, Development and operational acceptance tests.

**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**

<b>Teaching Assistant</b>	Ben Gurion University of the Negev Beer Sheva, Israel	2014-2019
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**Advanced courses:**

Particle Physics I  
General Relativity  
Astrophysics  
Introduction to Particles and Fields

**Multiple introductory courses,  
and courses for non-physicists.**

<b>Junior Lecturer</b>	Sami Shamoon Academic College Beer Sheva, Israel	2018-2019
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**Courses:**

Physics 2  
Hands-on Matlab:  
Scientific Computing.

**SERVICE****Journal Review**

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

**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.