

# Ioannis Florakis

## Curriculum Vitae

Section of Theoretical Physics,  
Physics Department,  
University of Ioannina  
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### Personal information

place of birth Athens, Greece  
citizenship Hellenic  
Languages Greek, English, French, German

### Employment

July 2018-today **Assistant Professor**, *Theoretical Physics Section, Physics Department, University of Ioannina (Greece).*

Sept 2016- July 2018 **Lagrange Fellow**, *Laboratoire de Physique Théorique et Hautes Energies (LPTHE)*, University of Paris 6, Pierre et Marie Curie (France).

Sept 2014-2016 **CERN Fellow**, *CERN Theory Division*, Geneva (Switzerland).

Sept 2011-2014 **Postdoc at the Max-Planck-Institut für Physik**, *Heisenberg Institute*, Munich (Germany).

Jan-Jul 2011 **Associate Scientist**, *CERN Theory Division*, Geneva, (MassTeV grant).

2008-2010 **Teaching Assistant (Moniteur)**, *member of the teaching and research personnel of CIES Jussieu, University of Paris 6 - Pierre et Marie Curie*, Courses of General Physics, Mechanics & elements of Hydrodynamics.

2007-2011 **Doctoral Candidate**, *Laboratoire de Physique Théorique (LPTENS), Ecole Normale Supérieure*, Paris.

### Education

2007-2011 **Doctoral degree in Theoretical Physics**, *Laboratoire de Physique Théorique (LPTENS)*, Ecole Normale Supérieure (diploma issued by the University of Paris 6), France.

2006–2007 **Master degree in Theoretical Physics**, *Laboratoire de Physique Théorique (LPTENS)*, Ecole Normale Supérieure (diploma issued by the University of Paris 6), France.

2001–2006 **Diploma in Physics**, *National and Kapodistrian University of Athens*, Greece.

### Research interests

- Spontaneous breaking of supersymmetry in gauge, string and supergravity theories
- Quantum corrections to BPS and non-BPS couplings in string effective actions

- Perturbation theory, IR renormalisation and higher loop (genus)  $g = 2, 3$  amplitudes in string theory
- String thermodynamics and cosmology
- Topological string amplitudes and connection with  $\mathcal{N} = 2$  gauge theories
- Non-geometric string backgrounds with fluxes & gauged supergravity

## Doctoral thesis

- title Théorie des Cordes et Applications Phénoménologiques et Cosmologiques, (*String Theory and Applications to Phenomenology and Cosmology*)
- advisor Dr. Costas Kounnas (Directeur de Recherche, CNRS, Ecole Normale Supérieure)

## Other experience

- 2013- Local organising committee, Corfu Summer Institutes
- 2011-2014 and 2016-today Associate member, CERN Theory Division (Switzerland)
- 2007 Research internship at the Linear Accelerator Laboratory, Orsay, France

## Fellowships and honours

- 2016-2018 Lagrange Fellowship (Paris)
- 2014-2016 CERN Fellowship
- 2011 European *MassTeV* Fellowship, CERN Theory Division
- 2007-2010 Fellowship by the French Ministry of Higher Education and Research
- 2006-2007 Fellow of the French Government (*BGF*)
- <2006 State Prize for excellence during undergraduate studies (IKY)
- 2000 State Prize for excellence in high school

## Referee activity for international journals

**Nuclear Physics B.**

**Physics Letters B.**

**Journal of High Energy Physics (JHEP).**

**European Physical Journal C.**

**International Journal of Modern Physics.**

## Supervision of Master Thesis

- 2017 Master thesis of Nina Javerzat, student at the Master 2 programme of Ecole Normale Supérieure, with title "Amplitudes à une boucle en théorie des cordes" (One loop amplitudes in string theory)

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## Publications and preprints

- 2017 I. Florakis, I. García-Etxebarria, D. Lüst and D. Regalado, *2d Orbifolds with Exotic Supersymmetry*, published in *Journal of High Energy Physics*, JHEP **1802** (2018), arXiv:1712.04318 [hep-th].
- 2017 I. Florakis and I. Rizos, *A Solution to the Decompactification Problem in Chiral Heterotic Strings*, published in *Nuclear Physics B*, NPB **921** (2017) arXiv:1703.09272 [hep-th].
- 2016 I. Florakis, *Gravitational Threshold Corrections in Non-Supersymmetric Heterotic Strings*, published in *Nuclear Physics B*, NPB **916** (2017), arXiv:1611.10323 [hep-th].
- 2016 I. Florakis and I. Rizos, *Chiral Heterotic Strings with Positive Cosmological Constant*, published in *Nuclear Physics B*, NPB **913** (2016) arXiv:1608.04582 [hep-th].
- 2016 I. Florakis and B. Pioline, *On the Rankin-Selberg method for higher genus string amplitudes*, published in *Communications in Number Theory & Physics*, Vol. 11, No. 2 (2017), arXiv:1602.00308 [hep-th].
- 2015 I. Florakis and A. Zein Assi,  $\mathcal{N} = 2^*$  *from Topological Amplitudes in String Theory*, published in *Nuclear Physics B*, NPB **909** (2016), arXiv:1511.02887
- 2015 C. Angelantonj, I. Florakis and M. Tsulaia, *Generalised universality of gauge thresholds in heterotic vacua with and without supersymmetry*, published in *Nuclear Physics B*, NPB **900** (2015), arXiv:1509.00027
- 2015 I. Antoniadis, I. Florakis, S. Hohenegger, K. S. Narain and A. Z. Assi, *Probing the Moduli Dependence of Refined Topological Amplitudes*, published in *Nuclear Physics B*, NPB **901** (2015), arXiv:1508.01477
- 2015 C. Angelantonj, I. Florakis, and B. Pioline, *Threshold corrections, generalised prepotentials and Eichler integrals*, published in *Nuclear Physics B*, NPB **897** (2015) arXiv:1502.00007
- 2014 I. Florakis, D. Sorokin and M. Tsulaia, *Higher Spins in Hyper-Superspace*, published in *Nuclear Physics B*, NPB **890** (2014), arXiv:1408.6675
- 2014 C. Angelantonj, I. Florakis and M. Tsulaia, *Universality of Gauge Thresholds in Non-Supersymmetric Heterotic Vacua*, published in *Physics Letters B*, PLB **736** (2014), arXiv:1407.8023
- 2014 I. Florakis, D. Sorokin and M. Tsulaia, *Higher Spins in Hyperspace*, published in *Journal of High Energy Physics*, JHEP **1407** (2014), arXiv:1401.1645
- 2013 I. Antoniadis, I. Florakis, S. Hohenegger, K. S. Narain and A. Z. Assi, *Non-Perturbative Nekrasov Partition Function from String Theory*, published in *Nuclear Physics B*, NPB **880** (2014), arXiv:1309.6688
- 2013 C. Condeescu, I. Florakis, C. Kounnas and D. Lüst, *Gauged supergravities and non-geometric Q/R-fluxes from asymmetric orbifold CFT's*, published in *Journal of High Energy Physics*, JHEP **1310** (2013), arXiv:1307.0999

- 2013 C. Angelantonj, I. Florakis and B. Pioline, *Rankin-Selberg methods for closed strings on orbifolds*, published in *Journal of High Energy Physics*, JHEP **1307** (2013), arXiv:1304.4271
- 2013 I. Antoniadis, I. Florakis, S. Hohenegger, K. S. Narain and A. Z. Assi, *Worldsheet Realization of the Refined Topological String*, published in *Nuclear Physics B*, NPB **875** (2013), arXiv:1302.6993
- 2012 C. Angelantonj, I. Florakis and B. Pioline, *One-Loop BPS amplitudes as BPS-state sums*, published in *Journal of High Energy Physics*, JHEP **1206** (2012), arXiv:1203.0566
- 2012 C. Condeescu, I. Florakis and D. Lüst, *Asymmetric Orbifolds, Non-Geometric Fluxes and Non-Commutativity in Closed String Theory*, published in *Journal of High Energy Physics*, JHEP **1204** (2012), arXiv:1202.6366
- 2011 C. Angelantonj, I. Florakis and B. Pioline, *A new look at one-loop integrals in string theory*, published in *Communications in Number Theory and Physics*, CNTP **6** (2012), arXiv:1110.5318
- 2011 A. E. Faraggi, I. Florakis, T. Mohaupt and M. Tsulaia, *Conformal Aspects of Spinor-Vector Duality*, published in *Nuclear Physics B*, NPB **848** (2011), arXiv:1101.4194
- 2010 I. Florakis, C. Kounnas, H. Partouche and N. Toumbas, *Non-Singular String Cosmology in a 2d Hybrid model*, published in *Nuclear Physics B*, NPB **844** (2011), arXiv:1008.5129
- 2010 I. Florakis, C. Kounnas and N. Toumbas, *Marginal Deformations of Vacua with Massive boson-fermion Degeneracy Symmetry*, published in *Nuclear Physics B*, NPB **873** (2010), arXiv:1002.2427
- 2009 I. Florakis and C. Kounnas, *Orbifold Symmetry Reductions of Massive Boson-Fermion Degeneracy*, published in *Nuclear Physics B*, NPB **820** (2009), arXiv:0901.3055

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## Conference proceedings - reviews

- 2018 I. Florakis, *Supersymmetry breaking in heterotic strings and the decompactification problem*, published in *Proceedings of Science*, PoS CORFU **2017** (2018)
- 2016 C. Angelantonj, I. Florakis and M. Tsulaia, *Universality in radiative corrections for non-supersymmetric heterotic vacua*, published in *Proceedings of Science*, PoS PLANCK **2015** (2016)
- 2015 I. Florakis, *Universality of radiative corrections to gauge couplings for strings with spontaneously broken supersymmetry*, published in *Journal of Physics: Conference Series*, J. Phys. Conf. Ser. **631** (2015), arXiv:1502.07537
- 2014 I. Florakis and A. Zein Assi,  *$N=2$  string amplitudes and the Omega background*, published in *Fortschritte der Physik*, Fortschr. Phys. **1-10** (2014), arXiv:1402.2974
- 2013 I. Florakis, *One-loop Amplitudes as BPS state sums*, published in *Proceedings of Science*, PoS (2012)101, arXiv:1303.3788

- 2010 I. Florakis, *String Vacua with Massive boson-fermion Degeneracy & Non-Singular Cosmology*, published in *Fortschritte der Physik*, Fortschr. Phys. **59** (2011), arXiv:1010.5126
- 2010 I. Florakis, *String Models with Massive boson-fermion Degeneracy*, published in *Fortschritte der Physik*, Fortschr. Phys. **58** (2010), arXiv:1001.2589

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## Long-term visits

02-03/13, 02/14 **CERN Theory Division, Geneva.**

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## Lecture Series Presented

- Nov 2015 **Lecture on “New ideas on Strings and Cosmology”**, *CERN Greek Teachers’ Training Programme, 2015.*
- Nov 2014 **Lecture on “Strings, Gravity and Cosmology: a modern approach”**, *CERN Greek Teachers’ Training Programme, 2014.*
- May 2014 **Lectures on “New methods for  $\mathcal{N} = 2$  amplitudes in string theory”**, Ludwig-Maximilian University, Munich (Germany), Invited series of 5 lectures.
- Nov 2010 **Lectures on String Thermodynamics and Non-Singular cosmology**, University of Liverpool, Liverpool (UK), Invited series of 4 lectures.

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## Talks

- Jul 2018 **Supersymmetry breaking in Heterotic Strings and corrections to gauge couplings**, ICNFP 2018 Conference - Kolymbari (Greece), Invited talk.
- Dec 2017 **Supersymmetry breaking in String Theory and Radiative Corrections**, Symposium in honour of Fokion Hadjoannou - University of Athens (Greece), Invited talk.
- Sep 2017 **Supersymmetry breaking in Heterotic Strings and the Decompactification Problem**, Testing Fundamental Physics Principles - Corfu Conference (Greece), Invited talk.
- Feb 2017 **Supersymmetry breaking and radiative corrections in String Theory**, University of Ioannina (Greece), Invited talk.
- Sep 2016 **Heterotic Strings with Positive Cosmological Constant**, Recent Developments in Strings & Gravity, Corfu Conference (Greece), Invited talk.
- Jun 2016 **Quantum corrections to couplings in non-supersymmetric strings**, String Pheno 2016 Conference, Ioannina (Greece), Invited talk.
- May 2016 **Quantum corrections to gauge couplings in non-supersymmetric string theory**, University of Ioannina (Greece), Invited talk.
- Jan 2016 **Topological amplitudes and  $N = 2^*$  in string theory**, ICTP Trieste (Italy), Invited talk.
- Sep 2015 **Quantum corrections to gauge couplings in non-supersymmetric string theory**, University of Athens (Greece), Invited talk.

- Sep 2015 **The universal structure of quantum corrections to gauge couplings in strings with broken supersymmetry**, Humboldt Kolleg 2015, Corfu (Greece), Invited talk.
- Jul 2015 **Quantum corrections to effective couplings in string theories with spontaneous supersymmetry breaking**, 8th Regional Meeting in String Theory, Nafplion (Greece), Invited talk.
- May 2015 **Spontaneous supersymmetry breaking in string theory and corrections to gauge couplings**, Planck 2015 - Ioannina (Greece), Invited talk.
- May 2015 **Quantum corrections to gauge couplings and universality in strings with spontaneously broken supersymmetry**, ICTP Trieste (Italy), Invited talk.
- Apr 2015 **Spontaneously supersymmetry breaking in string theory and threshold corrections**, HEP 2015 Conference, University of Athens (Greece), Invited talk.
- Dec 2014 **Radiative corrections to gauge couplings in string theories with spontaneously broken supersymmetry**, Theoretical Physics Workshop, University of Athens (Greece), Invited talk.
- Dec 2014 **Universality of radiative corrections to gauge couplings for strings with spontaneously broken supersymmetry**, DISCRETE 2014 Conference (London), Invited talk.
- Nov 2014 **Radiative corrections and spontaneously supersymmetry breaking in string theory**, Ludwig Maximilians University, Munich (Germany), Invited talk.
- Oct 2014 **Radiative corrections to gauge couplings string vacua with spontaneously broken supersymmetry**, University of Torino, Torino (Italy), Invited talk.
- Sept 2014 **Radiative corrections to gauge couplings string theories with spontaneously broken supersymmetry**, National Technical University of Athens, (Greece), Invited talk.
- Sept 2014 **Universality of gauge thresholds for heterotic vacua with spontaneously broken supersymmetry**, Workshop on “Quantum Fields and Strings 2014, Corfu Summer Institute (Greece), Invited talk.
- May 2014 **Gauged Supergravities & Non-Geometric fluxes from asymmetric orbifolds**, Bayrischzell Workshop 2014, Bavaria (Germany), Invited talk.
- Apr 2014 **One-Loop Amplitudes in String Theory : a refined approach**, Università di Roma - Tor Vergata, Rome (Italy), Invited talk.
- Mar 2014 **Aspects of String Theory and applications**, Institute of Nuclear Physics, Lyon (France), Invited talk.
- Jan 2014 **A Stringy realization of the  $\Omega$  background from  $\mathcal{N} = 2$  amplitudes**, Università di Milano - Bicocca, Milan (Italy), Invited talk.

- Dec 2013 **One-Loop Amplitudes in String Theory : a refined approach**, Max Planck Institut für Gravitationsphysik (Albert Einstein Institute), Potsdam/Golm (Germany), Invited talk.
- Oct 2013 **Gauged Supergravities & Non-geometric Fluxes from Asymmetric Orbifolds**, Athens Polytechnic University (NTUA), Greece, Invited talk.
- Oct 2013 **Nekrasov Backgrounds from string amplitudes**, Joint ULB, VUB, KULeuven, UMons seminar, Brussels., Invited talk.
- Oct 2013  **$\mathcal{N} = 2$  String Amplitudes and the  $\Omega$  background**, Joint ERC workshop on “MassTeV, Superfields and Strings & Gravity”, Munich, Invited talk.
- Sep 2013 **Nekrasov Backgrounds from  $\mathcal{N} = 2$  String Amplitudes**, DESY Theory Workshop: “Non-perturbative QFT: Methods and Applications”, Hamburg, Invited talk.
- Sep 2013  **$\mathcal{N} = 2$  String Amplitudes & Nekrasov Backgrounds**, Corfu Summer Institute (Greece), Invited talk.
- Jun 2013  **$\mathcal{N} = 2$  String Amplitudes and the Refined Topological String**, CERN Theory Seminar (Geneva), Invited talk.
- May 2013  **$\mathcal{N} = 2$  String Amplitudes and the Refined Topological String**, Rencontres Théoriciennes, Institut Henri Poincaré (Paris), Invited talk.
- Mar 2013  **$\mathcal{N} = 2$  String Amplitudes and the Refined Topological String**, University of Rome “Tor Vergata”, Invited talk.
- Mar 2013 **Novel methods for  $\mathcal{N} = 2$  BPS-saturated amplitudes in String Theory**, XXV Workshop: “Beyond the Standard Model”, Bad Honnef (Germany).
- Oct 2012 **A new look at One-Loop Amplitudes in String Theory**, University of Torino, Invited talk.
- Sep 2012 **A new look at One-Loop Amplitudes in String Theory**, Symposium : Kounnas-Fest “Tales on Supergravity, Strings and QCD” (Cyprus), Invited talk.
- Sep 2012 **One-Loop Amplitudes as BPS-state sums**, Corfu Summer Institute (Greece).
- Jun 2012 **One-Loop Amplitudes as BPS-state sums**, Laboratoire de Physique Théorique, Ecole Normale Supérieure (Paris), Invited talk.
- Apr 2012 **One-Loop Amplitudes as BPS-state sums**, University of Athens (Greece), Invited talk.
- Mar 2012 **One-Loop Amplitudes as BPS-state sums**, University of Cyprus, Invited talk.
- Dec 2010 **String Vacua with Massive boson-fermion Degeneracy & Non-Singular Cosmology**, Imperial College (London), Invited talk.
- Nov 2010 **String Vacua with Massive boson-fermion Degeneracy & Non-Singular Cosmology**, University of Rome “Tor Vergata”, Invited talk.
- Nov 2010 **Lectures on String Thermodynamics and & Non-Singular Cosmology**, University of Liverpool, Invited series of lectures.

- Oct 2010 **String Vacua with Massive boson-fermion Degeneracy & Non-Singular Cosmology**, University of Amsterdam, Invited talk.
- Oct 2010 **String Vacua with Massive boson-fermion Degeneracy & Non-Singular Cosmology**, University of Torino, Invited talk.
- Oct 2010 **String Vacua with Massive boson-fermion Degeneracy & Non-Singular Cosmology**, Arnold Sommerfeld Centre - LMU Munich, Invited talk.
- Sep 2010 **Marginal Deformations of Vacua with Massive boson-fermion Degeneracy**, Workshop on Cosmology and Strings - Corfu Summer Institute (Greece).
- Jan 2010 **String Models with Massive Boson-Fermion Degeneracy Symmetry**, National Centre for Scientific Research “Demokritos” (Greece), Invited talk.
- Sep 2009 **String Models with Massive Boson-Fermion Degeneracy**, Workshop on Cosmology and Strings - Corfu Summer Institute (Greece).
- Sep 2009 **String Models with Massive Boson-Fermion Degeneracy**, 47th International School of Subnuclear Physics - EMCSC Erice (Sicily).

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## Selected schools and conferences

- Jul 2018 **ICNFP 2018**, Kolymbari (Greece).
- Jun 2016 **String Pheno 2016**, Ioannina (Greece).
- May 2015 **Planck 2015**, Ioannina (Greece).
- Dec 2014 **DISCRETE 2014**, *Fourth Symposium on Prospects in the Physics of Discrete Symmetries*, London (United Kingdom).
- May 2014 **Bayrischzell Workshop “Quantized Geometry and Physics”**, Bavaria (Germany).
- Oct 2013 **Joint ERC workshop on “MassTeV, Superfields and Strings & Gravity”**, Arnold Sommerfeld Centre, LMU Munich.
- Sep 2013 **DESY Theory Workshop: “Non-perturbative QFT: Methods and Applications”**, Hamburg (Germany).
- Mar 2013 **XXV Workshop: “Beyond the Standard Model”**, Bad Honnef (Germany).
- 2009-2016 **CERN Winter Schools on Supergravity, Strings and Gauge Theories**, CERN (Geneva).
- Nov 2012 **ASC Workshop “Geometry and Physics”**, Max Planck Institute for Physics (Munich).
- Jul 2012 **Strings 2012**, Ludwig Maximilians University (Munich).
- Jul 2012 **String Phenomenology TH Institute**, CERN (Geneva).
- Jul 2012 **62nd Lindau Nobel Laureate Meeting on “Physics”**, Lindau (Germany), representing Greece.  
Supported by the Onassis Foundation

- Sep 2011 **School on Algebraic Geometry for String Theorists**, Arnold Sommerfeld Centre - LMU Munich.
- Aug 2011 **XLIIIème Institut d'été**, Ecole Normale Supérieure (Paris).
- Jul 2010 **String Pheno 2010**, Collège de France (Paris).
- Jul 2009 **5th Crete Regional Meeting on String Theory**, Kolymbari, Crete (Greece).
- May 2009 **Workshop on Cosmological Frontiers in Fundamental Physics**, Laboratory of Astroparticle Physics and Cosmology (Paris).
- Sep 2008 **4th Young Researchers Network Workshop of the European Superstring Theory Network**, Cyprus.
- Sep-Nov 2007 **Paris-Brussels-Amsterdam Doctoral School**.