Saman Soltani

Curriculum Vitae

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Personal information

First name	Saman
Last name	Soltani
Place and date of birth	Borgomanero (Italy), May 2nd 1994
Nationality	Italian

Research Interests

My main interests are the following ones.
Mathematics, in particular algebra and group theory, differential and algebraic geometry, complex and functional analysis;
Quantum Field Theory, in particular and path integral quantization, non-abelian gauge theories, renormalization theory, non-perturbative aspects;
General Relativity, in particular gravitational waves, black hole physics, tetradic formalism and gravity as a gauge theory;
Quantum Gravity Problem, in particular contrasts between quantum and gravitational physics, quantum gravity phenomenology, string theory approach, non-commutative spacetimes approach, canonical and loop quantum gravity approach;
String Theory, in particular supersymmetry, supergravity, superstrings, F-theory, compactification models.

Work experience and education

October 2018–Present — **PhD Student in Theoretical Particle Physics at SISSA, International School for Advanced Studies, of Trieste (Italy)**.
- As a first year student I'm attending a series of advanced graduate level classes.
- Supervisor: to be decided.

September 2016–October 2018 — **Student at Sapienza University of Rome (Italy), Master's Degree in Theoretical Physics (LM-17 class)**.
- Graduated with marks 110/110 *summa cum laude*. Final GPA (Grade Point Average) was 30/30 (100%)
- Defended a Master thesis in string theory topics, focused on F-theory and non-geometry, whose title was "Gauge Interactions in String Theory and Related Non-Geometric Aspects". Thesis Advisor: Prof. Fabio Riccioni.

February 2018 – October 2018 — **Student of the Excellence Programme for Master's Degree in Physics (LM-17 class)**.
Successfully completed the Excellence Programme offered by Sapienza University of Rome. Excellence Programme consists in attending specialisation courses in topics of interest for the student and is offered for worthy students.

January 2018 – July 2018 **Didactic Laboratory Assistant**.
As a winner of a 150 hours collaboration scholarship, I took part in didactic laboratory experiences organisation for the 4 courses Mechanics Laboratory, Thermodynamics Laboratory, Electromagnetism and Circuits Laboratory, Optics Laboratory.

October 2017 – October 2018 **Member of CGAQ Commission**.
Student rep at the commission for management and assurance of quality at Sapienza University of Rome Physics Department, which controls and tries to improve teaching and organisation quality.

October 2016 – October 2018 **Member of Students-Teachers Joint Commission**.
Student rep at the students-teachers joint commission at Sapienza University of Rome Physics Department, which is a commission made up by students and teachers in equal number, involved in problem solving activities for the specific Master's degree in Physics.

February 2014 – July 2016 **Student of the Excellence Programme for Bachelor's Degree in Physics (L-30 class)**.
Successfully completed the Excellence Programme offered by Sapienza University of Rome. Excellence Programme consists in attending specialisation courses in topics of interest for the student and is offered for worthy students.

September 2013 – July 2016 **Student at Sapienza University of Rome (Italy), Bachelor's Degree in Physics (L-30 class)**.
• Graduated with marks 110/110 *summa cum laude*. Final GPA (Grade Point Average) was 29.9/30 (99.6%)
• Defended a Bachelor's thesis in galactic dynamics topics related with gravitational waves detection named "Evolution of a Non-Relativistic Black Hole Binary Sistem".
Thesis Advisor: Prof. Roberto Capuzzo Dolcetta.

September 2008 – July 2013 **Student at "Liceo Scientifico Galileo Galilei" in Borgomanero (Italy), Scientific Secondary School Degree**.
Graduated with marks 100/100.

Skills

Academical **During Bachelor's and Master's degree I learned many skills**.
- Study and duties management and organisation
- Address Faculty and University problems from both teachers' and students' point of view
- Mathematics modelling
- Physics modelling
- C programming
- Laboratory and research work, including both teamwork

Language **Italian: mother tongue**.

English: fluent scientific knowledge.

Understanding		Speaking		Writing
Listening	Reading	Spoken Interaction	Spoken Production	
B2	C1	B2	B2	B2
Levels: A1/A2 Basic User - B1/B2 Independent User - C1/C2 Proficient User				

Self-assessment according to Common European Framework of Reference.

Computer **Independent user**.

Information processing	Communication	Content creation	Safety	Problem solving
B	C	B	B	B
Levels: A Basic User - B Independent User - C Proficient User				

Self-assessment according to European grid of Digital Competences.

Driving licence **B**.

Attachments

1 **Summary of the Master Thesis**.

In this thesis work after presenting many aspects of string theory, we have studied the possibility of an F-theory insight in order to clarify issues related to non-geometric fluxes and exotic branes in string theory.Concretely, we generalise in 8 dimensions the F-theory/type I/heterotic duality to non-geometric backgrounds; we show how a straightforward generalisation of F-theory from the S-duality case to the U-duality case is not available, mainly because of non-geometric issues; we try to geometrise the truncated U-duality group in 8 dimensions in a 6 dimensional theory, noticing that it is not possible to take general monodromies without spoiling the supersymmetry of the theory; we finally use a duality chain in 7 dimensions in order to enforce the statement that non-geometry is the rule in string theory and not a pathological aspect.

2 **Summary of the Bachelor Thesis**.

My Bachelor's thesis consisted in studying the evolution of a black hole binary system in a stellar environment in order to make it compatible with the amazing gravitational waves detection made recently by LIGO and VIRGO observatories. Gravitational coalescence alone is far too slow to produce a collapse within reasonable times, so using typical galactic dynamics tools, e.g. gravitational slingshot, it is possible to produce an acceleration of the evolution of the system. Putting naively some numbers into the equations can be found that globular clusters, in opposition to galactic nuclei and open clusters, should be the most suitable environments to produce collapses within the age of the Universe.

March 9, 2019.