

## CURRICULUM VITAE

# Octavio Pomponio



*Born in Rosario, Argentina*

18 August 1992

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## EDUCATION

University of Bologna Nov 2018– ongoing  
*PhD in Physics* *Curriculum:* Theoretical Physics and Foundations of Physics  
*PhD Project:* Non perturbative aspects of quantum many-body systems out of equilibrium  
*Supervisor:* Prof. F. Ravanini  
*Co-supervisor:* Prof. E. Ercolessi

University of Bologna Oct 2015–Mar 2018  
*M.Sc. in Physics* 110/110 cum laude · *Curriculum:* Theoretical Physics  
*Thesis title:* Quantum quenches in  $\mathbb{Z}_n$  symmetric spin chains: an iTEBD study  
*Supervisor:* Prof. F. Ravanini  
*Co-supervisor:* Prof. G. Takacs

University of Bologna Oct 2012–Dec 2015  
*B.Sc. in Physics* 110/110 cum laude  
*Thesis title:* Phase transitions in the Ising model  
*Supervisor:* Prof. E. Ercolessi

Liceo Scientifico "Francesco Filelfo" 2007–2012  
*High School Diploma* Scientific High School of Tolentino (MC), Italy  
Final mark: 100/100 cum laude

## M.SC. THESIS

*Title* Quantum quenches in  $\mathbb{Z}_n$  symmetric spin chains: an iTEBD study  
*Supervisors* Prof. F. Ravanini, Prof. G. Takacs  
*Short description* In this work a paradigmatic problem is analyzed: the out of equilibrium dynamics of one dimensional isolated quantum systems after a quantum quench. The focus is on  $\mathbb{Z}_n$  symmetric spin chains dynamics and how it gets modified when the symmetry is explicitly broken. The original part of the work is in the study of entanglement propagation in the 3-state Potts model with longitudinal field in its paramagnetic phase, where a rapid increase of the entanglement production rate was observed, as was already proven in the quantum Ising model. The phenomenon is associated with the comparison of a new particle in the post-quench Hamiltonian spectrum and can be explained as the out of equilibrium version of the well known Gibbs paradox.

## IT SKILLS

Linux, Microsoft Windows, iOS  
L<sup>A</sup>T<sub>E</sub>X, C/C++, Python

## LANGUAGES

*Italian* mother tongue  
*Spanish* mother tongue  
*English* C1 (CEF) level

## REFERENCES

*Prof. Francesco Ravanini*  
University of Bologna  
francesco.ravanini@bo.infn.it

*Prof. Elisa Ercolessi*  
University of Bologna  
elisa.ercolessi@unibo.it

*Prof. Gabor Takacs*  
BME University  
takacsg@eik.bme.hu

## WORK EXPERIENCE

Budapest University of Technology  
and Economics (BME).

Mag 2018–Oct 2018

*Research fellowship* Under the supervision of Prof. Gabor Takacs I worked at the Department of Theoretical Physics of BME University inside the BME "Momentum" Statistical Field Theory research group.

University of Bologna

Oct 2016–May 2017

*Laboratory assistant* I worked as an assistant for the physics laboratory course of the third year of the BSc in Physics at the School of Science under the supervision of Prof. Gilda Scioli, where my primary role was to assist them during the laboratory sessions. I also had the same role for the second year course of BSc in Astronomy under the supervision of prof. G. P. Siroli.

## SCHOOLS AND WORKSHOPS

Galileo Galilei Institute

Feb 2020

*School* Lectures on Statistical Field Theory at Galileo Galilei Institute For Theoretical Physics.  
Main topics: Topology and geometry in condensed matter physics, Topological phases of electrons, Two-dimensional conformal field theory.

Institut Henri Poincaré

Sep 2019

*School* Lectures on Statistical and Condensed Matter Field Theory at Institut Henri Poincaré (Paris, France).  
Main topics: Topological Matter, Growth processes and integrability, Entanglement and information spreading, Many-body quantum chaos and random matrix theory.

Galileo Galilei Institute

Feb 2019

*School* Lectures on Statistical Field Theory at Galileo Galilei Institute For Theoretical Physics.  
Main topics: Transport in closed one-dimensional systems, CFT curved-space approach to inhomogeneous systems, Tomonaga-Luttinger liquids: from field theory to experimental realisations.

## LIST OF PUBLICATIONS

M. Lencses,  
O. Pomponio,  
G. Takacs "Relaxation and entropy generation after quenching quantum spin chains"  
arXiv:2004.09550v1, 20 Apr 2020

O. Pomponio,  
L. Pristiyak,  
G. Takacs "Quasi-particle spectrum and entanglement generation after a quench in the quantum Potts spin chain"  
Journal of Statistical Mechanics Theory and Experiment  
2019(1):013104