

# David Preti



## Contact Info

(+39) 331 3222560

david.preti@to.infn.it  
preti.david@gmail.com

<https://pretidav.github.io>  
<https://github.com/pretidav>

## Languages

**Italian** (Native)  
**English** (Advanced)  
**Spanish** (Intermediate)  
**Russian** (Elementary)

## Programming Skills

**GNU Linux** (Expert)  
**Windows** (Expert)  
**MAC-OS** (Expert)

**Python** (Expert)  
Numpy, Pandas, Matplotlib  
Scipy, Scikit-learn, Seaborn  
NLTK, Word2Vec, openCV  
TensorFlow

**C/C++** (Expert)  
OpenMP, OpenMPI

**Bash/Perl** (Expert)  
**LaTeX** (Advanced)  
**MatLab** (Intermediate)

**HPC** (Expert)  
Galileo, Marconi (CINECA)  
Altamira (IFCA)  
FinisTerae2 (CESGA)  
Marenostrum4 (BSC)

## Working Experience

- 12/2017 - ongoing **Postdoctoral Research Fellow** INFN (Turin - Italy)  
*Statistical Field Theory - Lattice Quantum Field Theory*
- 09/2016 - 12/2016 **Short Term Visitor** Higgs Center for Theoretical Physics (Edinburgh - UK)  
*Lattice Quantum Chromo-Dynamics and BSM physics*
- 03/2014 - 9/2017 **Predocctoral Research Fellow** CSIC (Madrid - Spain)  
*Lattice Quantum Chromo-Dynamics and Renormalization*

## Education

- 2014 - 2017 **Ph.D. in Theoretical Physics** Universidad Autonoma de Madrid - IFT/CSIC  
Thesis: Determination of Fundamental Parameters in the Hadronic Sector of the Standard Model (Supervisor: Prof. C. Pena)
- 2010 - 2013 **MS in Physics** Sapienza University of Rome  
Thesis: Non-Perturbative Renormalization of  $\Delta F = 2$  Four-fermion Operators (Supervisor: Prof. M. Papinutto)
- 2007 - 2010 **BS in Physics** Sapienza University of Rome  
Thesis: Bose-Einstein Condensation in Trapped Gases (Supervisor: Prof. S. Caprara)

## Selected Publications

- Cossu et al., 2019 **Strong Dynamics with matter in multiple representations:  $SU(4)$  gauge theory with fundamental and sextet fermions**  
Eur.Phys. J. C79 (2019) no.8, 638
- Campos et al., 2018 **Non-perturbative quark mass renormalization and running in  $N_f = 3$  QCD**  
Eur. Phys. J C78 (2018) no.5, 387
- Dimopoulos et al., 2018 **Non-perturbative renormalization and running of BSM four-quark operators in  $N_f = 2$  QCD**  
Eur. Phys. J C78 (2018) no.7, 579

## Soft Skills

Communication - TeamWork - Critical Thinking - Curiosity

## Certified Specializations

- 2018 - 2019 **Deep Learning** deeplearning.ai
- 2019 - ongoing **Reinforcement Learning** University of Alberta - Alberta Machine Learning Institute

## Research Interests

I find particularly interesting **Machine Learning**, artificial **Neural Networks** and their interface with Statistical Mechanics. Recently I integrated my academic knowledge of machine learning with online courses and by participating to Kaggle competitions achieving a satisfactory expertise in several fields. Among my interests in **Deep Learning** there are **Computer Vision** and **Natural Language Processing** (NLP), using data science libraries in Python like numpy, pandas, sklearn, seaborn and more specific tools like TensorFlow, openCV, NLTK and Word2Vec. More recently I am focusing on both theory and applications of **Reinforcement Learning** and (artificial) decision making processes. My academic research activities are based on deepening our understanding of strongly coupled **Quantum Field Theories** (QFT) in the Standard Model (SM) and beyond (BSM) including Quantum Gravity, using both analytical and numerical approaches. The latter relies on **Monte Carlo** (MC) methods which allows for first-principle computations of the theory discretized on a space-time four-dimensional lattice. These techniques are currently implemented on the latest platforms for **High Performance Computing** (HPC).