David Preti

Contact Info

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https://pretidav.github.io
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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)
FinisTerrae2 (CESGA)
Marenostrum4 (BSC)

Working Experience

12/2017 - ongoing — **Postdoctoral Research Fellow** — INFN (Turin - Italy)
Statistical Field Theory - Lattice Field Theory

09/2016 - 12/2016 — **Short Term Visitor** — Higgs Center for Theoretical Physics (Edinburgh - UK)
Lattice QCD and BSM physics

03/2014 - 9/2017 — **Predoctoral Research Fellow** — CSIC (Madrid - Spain)
Lattice QCD 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 Δ 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**
arXiv:1904.08885 [hep-lat] (Submitted to Eur. Phys. J C)

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

This skill played a key role throughout my career. Effective and clear communication allowed me to achieve great success as a conference speaker and in scientific writing.

Teamwork

I worked within an international collaboration based in Berlin called "ALPHA", which counts around 30 scientists from all over Europe. In this framework I had both an active role as a researcher and as a project coordinator, with a particular attention to deadlines' and quality standard's meeting. I co-advised a master thesis and gave lectures alongside my standard work.

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. My main focuses have been Computer Vision (ATR, and Generative Models) and Natural Language Processing (NLP), using standard data science libraries in Python like numpy, pandas, sklearn, seaborn and more specific tools like TensorFlow, openCV, NLTK and Word2Vec.
My academic research activities are focused on deepening our understanding of strongly coupled quantum field theories 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 lattice. These techniques are currently implemented on the latest platforms for High Performance Computing (HPC).