



Internationally recognized researcher in computational theoretical high energy and nuclear physics, with years of experience in programming, data analysis and Monte Carlo methods using Top500 High Performance Computing resources. Outstanding publication record and presentation skills in an international community. Strong curiosity towards new challenges and ability to deliver results on time, even when tackling previously unknown subjects. Hands-on experience with ML in physics. Able to take the lead and perform well as part of a team. Avid learner with strong analytical, modeling and data oriented backgrounds, interested in new opportunities in the growing fields of deep learning and generative models.

## Skills

- Daily experience with data manipulation, statistical analysis, Monte Carlo methods
- Programming experience in Python and C/C++/Fortran (+shell scripting & Mathematica)
- Experience with DL architectures and tools (TensorFlow, Keras, PyTorch, sklearn)
- Excellent presentation skills (oral and written)
- Focused and quick in learning new topics
- Excellent ability to actively lead a collaborative effort and communicate in a team
- Languages: Italian (native), English (fluent), Japanese (basic)

## Experience

### **SPECIAL POSTDOCTORAL FELLOW, RIKEN BNL RESEARCH CENTER AND RIKEN NISHINA CENTER – 2016-PRESENT**

- Highly competitive Japanese SPDR fellowship with a personal research grant for 3 years to perform my own research plan: Monte Carlo calculations of strongly-coupled quantum gauge theories for describing dark matter and aid experimental searches that are undergoing in the US using multi-million \$ experiments
- Outstanding oral presentation award at Early Career Researcher Symposium at BNL in 2016
- Awarded computing allocation at BNL to study Dark Matter theories.
- Visiting Research Affiliate at Lawrence Berkeley National Laboratory to perform research on nuclear structure using massively parallel supercomputers (NVidia GPUs and IBM Power9): published research article on the journal Nature and ACM Gordon Bell prize finalist.
- Performing research in machine learning for physics using generative models to improve sampling of physical observables in Monte Carlo approaches and study phase transitions in materials
- Use Anomaly Detection Generative Adversarial Networks to look for new physics in open source data from the experiments at the Large Hadron Collider

### **POSTDOCTORAL RESEARCHER, LAWRENCE LIVERMORE NATIONAL LABORATORY, US – 2013-2016**

- Hired as an expert in performing Monte Carlo calculations of scalar particles in strongly-coupled quantum gauge theories, leading a new effort at LLNL which produced several publications
- Active core member of 4 international collaborations (LatKMI, LatticeStrongDynamics, CalLat and MCSMC) with leading roles in several projects
- Started independent projects in dark matter physics, nuclear physics and quantum gravity
- Developed open source Lattice QCD code for Monte Carlo simulations and time series analysis
- Physics and Life Sciences Outstanding Postdoctoral Fellow award at LLNL in 2016
- Awarded 3-years (2016-2019) laboratory grant as co-PI to study the origin of matter with supercomputers

### **JSPS FELLOW, KOBAYASHI-MASKAWA INSTITUTE, NAGOYA, JAPAN – 2012**

- Prestigious Japanese fellowship for foreign graduate students to perform their own projects.
- Joined the LatKMI collaboration at KMI as a new member and managed to obtain the first result of a light scalar particle in many-flavor quantum non-abelian gauge theories, which started a fruitful field of research in the international lattice BSM community

## Education

- ▶ University of Edinburgh, Edinburgh, UK – PhD in Theoretical Particle Physics, 2013
  - ▶ supported by prestigious SUPA (Scottish Universities Physics Alliance) scholarship for 3.5 years (and JSPS fellowship for 0.5y)
  - ▶ awarded Diploma Prize at International School of Subnuclear Physics, Erice, Italy (2011) for work on Extra Dimensions
- ▶ University of Milan, Milan, Italy – Master of Science in Theoretical Physics, 2009
  - ▶ supported by scholarship “Homo Sapiens Sapiens”
- ▶ University of Milan, Milan, Italy – Bachelor of Science in Physics, 2007

## Selected Publications

Complete list of academic publications can be found on my InSpire High Energy Database profile:

<http://inspirehep.net/author/profile/E.Rinaldi.1>

1. Chia Cheng Chang, Amy Nicholson, [ER](#), Evan Berkowitz, Nicolas Garron, David Brantley, Henry Monge-Camacho, Christopher Monahan, Chris Bouchard, M. A. Clark, Balint Joo, Thorsten Kurth, Kostas Orginos, Pavlos Vranas, Andre Walker-Loud: “A per-cent-level determination of the nucleon axial coupling from quantum chromodynamics”, *Nature* 558, 91–94 (2018)
2. Evan Berkowitz, [ER](#), Masanori Hanada, Pavlos Vranas: “Gauged and Ungauged: A Nonperturbative Test”, *JHEP* 1806 (2018) 124
3. Hooman Davoudiasl, Pier Paolo Giardino, Ethan Neil, [ER](#): “Unified scenario for Composite Right-Handed Neutrinos and Dark Matter”, *Phys. Rev. D* 96 (2017) 115003
4. A. Bazavov, H.-T. Ding, P. Hegde, O. Kaczmarek, F. Karsch, E. Laermann, Swagato Mukherjee, H. Ohno, P. Petreczky, [ER](#), H. Sandmeyer, C. Schmidt, Chris Schroeder, S. Sharma, W. Soeldner, R.A. Soltz, P. Steinbrecher, P.M. Vranas: “Skewness and kurtosis of net baryon-number distributions at small values of the baryon chemical potential”, *Phys. Rev. D* 96 (2017) 074510
5. T. Appelquist, E. Berkowitz, R.C. Brower, M.I. Buchoff, G.T. Fleming, X.-Y. Jin, J. Kiskis, G.D. Kribs, E.T. Neil, J.C. Osborn, C. Rebbi, [ER](#), D. Schaich, C. Schroeder, S. Syritsyn, P. Vranas, E. Weinberg, O. Witzel: “Direct Detection of Stealth Dark Matter through Electromagnetic Polarizability”, *Phys. Rev. Lett.* 115 (2015) 171803 (featured in Editors’ Suggestions)
6. Yasumichi Aoki, Tatsumi Aoyama, Masafumi Kurachi, Toshihide Maskawa, Kei-ichi Nagai, Hiroshi Ohki, [ER](#), Akihiro Shibata, Koichi Yamawaki, Takeshi Yamazaki: “Light composite scalar in twelve-flavor QCD on the lattice”, *Phys. Rev. Lett.* 111 (2013) 16, 162001