Curriculum Vitae – Edoardo Carlesi

Personal information

Birth 23/09/1983, Pisa, Italy.
Citizenship Italian
Contact data ecarlesi83@gmail.com

Education

2014 Ph.D. (Cum Laude) in Theoretical Physics, Universidad Autonoma de Madrid (Spain)

2009 MSc (Cum Laude) in Theoretical Physics, Università degli Studi Roma Tre (Italy)

2005 BS (Cum Laude) in Physics, Università degli Studi Roma Tre (Italy)

Professional Experience

04/2021 – Today Machine Learning Specialist, Top Network SpA, Rome, Italy

06/2020 – 04/2021 Postdoctoral fellow (Machine Learning and Data Science for Astrophysics) at the Racah Institute Of Physics, Hebrew University (HU), Jerusalem, Israel

01/2018 – 02/2020 Postdoctoral fellow at the Astrophysikalisches Institut Potsdam (AIP), Potsdam, Germany

10/2014 – 10/2017 Postdoctoral fellow at the Racah Institute Of Physics, Hebrew University (HU), Jerusalem, Israel

11/2010 – 09/2014 Assistant Professor and Ph.D. student at the Universidad Autonoma de Madrid (UAM), Madrid, Spain

03/2012 – 06/2012 Visiting student at the Institute of Astronomy, School of Physics, University of Sydney, Sydney, Australia

05/2008 – 10/2009 Java developer, Sinologische Institut Heidelberg, Heidelberg, Germany

05/2008 – 11/2008 Visting student at the Heidelberg Institut für Theoretische Physik, Ruprecht Karls Universität Heidelberg, Heidelberg, Germany

Academia

Author and co-author of 19 publications in peer-reviewed journals

Awarded over $45k$$ in grants for research projects and conference attendance (HPC Workshop Boulder, Colorado, Pacific 2013, CosKASI S.Korea ...)

30+ Invited and contributed talks in international conferences (Galaxy Flows Vietnam, Dark Energy Workshop Ringberg, Near Field Cosmology Innsbruck ...)

20+ Seminars in international Universities and research centers (UPenn Philadelphia, IAC Tenerife, AIP Potsdam, U. Sydney ...)

10+ International schools and workshops (Cosmology SS Azores, EUCLID workshop Oxford, ISAAP SS Heidelberg ...)

IT Skills

OS Linux, Android, Windows

Programming languages Very good knowledge of C, C++, Python and bash scripting, good knowledge of Java, IDL and matlab/octave, basic knowledge of Android Java/XML app development, basics of Fortran

Parallel APIs Very good programming knowledge of MPI and OpenMP, Spark (PySpark) and SparkML, basics of OpenACC and CUDA for GPU

Machine Learning Hands-on knowledge of standard algorithms with Python (scikit-learn, Keras/Tensorflow, PyTorch). Supervised learning: linear regression, SVM, Decision Trees, Random Forest, Gradient Boosted Trees. Unsupervised learning: k-means, Self-Organizing-Maps. Deep Neural Networks: ANNs, CNNs, RNN, AutoEncoders, Boltzmann Machines

Earth Observations Google Earth Engine, QGIS, geopandas

Other languages/packages known TeX, HTML/CSS, gnuplot, OpenOffice, GIT version control

Scientific Software and Numerical Packages

METRO-C++ A scalable C++11/14, MPI code for MergerTree calculation. Main developer.

PyRCODIO Python Routines for COsmology and Data I/O, a Python package (with external C bindings for computationally intensive operations) for analysis and post-processing of cosmological simulations. Main developer.

P-MergerTree Adaptation of the MergerTree AHF tool for MPI. Main developer.

IceCore Generator of constrained Gaussian white noise fields for Initial Conditions, C++. I MPI-parallelized the code and I am mantaining it.

AHF Halo Finder for cosmological simulations. Written in C, MPI+OpenMP parallel, I designed and implemented a version suited for non-standard dark energy models.

Gadget-2.0 Cosmological N-Body/hydro SPH code written in C, MPI parallel. I designed and implemented a version suited for non-standard and interacting dark energy models.

CMBEasy Boltzmann code for cosmological parameter estimation. Written in C++, MPI parallel, I designed an implemented a version suited for neutrino-interacting dark energy models.

MOOC Courses and Certificates

Udemy Deep Learning A-Z: Hands-On Artificial Neural Networks

Udemy Spark and Python for Big Data with PySpark

Udemy Python for Data Science and Machine Learning Bootcamp

Udemy Python and Machine Learning for Financial Analysis

Udemy Modern Web Scraping with Python

Udemy Docker

Coursera Machine Learning

Coursera Bayesian Statistics: from Concept to Data Analysis

Coursera Python and Statistics for Financial Analysis

Teaching Experience	220 hours of teaching (Physics/Electronics lab.) at the Universidad Autonoma de Madrid, 2011–2014
	40 hours of teaching (Electromagnetism) at Universita' Roma 3, 2007–2008
Languages	**Italian** Mother tongue
	English Fluent (C2)
	Spanish Fluent (C2)
	German Fluent (C1)
	French Fluent (C1)
	Serbo-Croatian Fluent (C1)
	Russian Conversational (B2)
	Hebrew Conversational (B2)
	Arabic (Levantine Dialect and MSA) Conversational (B2)
	Portuguese Basic (B1)
	Mandarin Chinese Beginner (A2)

21. A parameter-free classification of the Cosmic Web based on unsupervised learning and the k-means algorithm.
E. Carlesi, Y. Hoffman
In prep. (2021)

20. Machine Learning and the dynamics of the Local Group
E. Carlesi, Y. Hoffman, N. I. Libeskind, S. Gottloeber.
In prep. (2021)

19. How common is the Local Group?
E. Carlesi, Y. Hoffman, N. I. Libeskind, S. Gottloeber.
In prep. (2021)

18. The HESTIA project: simulations of the Local Group.
Noam I. Libeskind, **Edoardo Carlesi**, Rob J. J. Grand, Arman Khalatyan, Alexander Knebe, Ruediger Pakmor, Sergey Pilipenko, Marcel S. Pawlowski, Martin Sparre, Elmo Tempel, Peng Wang, Helene M. Courtois, Stefan Gottloeber, Yehuda Hoffman, Ivan Minchev, Christoph Pfrommer, Jenny G. Sorce, Volker Springel, Matthias Steinmetz, R. Brent Tully, Mark Vogelsberger, Gustavo Yepes.
MNRAS, 2509, 2020

17. The Mass Assembly History of the Local Group from Constrained Simulations.
E. Carlesi, Y. Hoffman, S. Gottlöber, Noam I. Libeskind, Alexander Knebe, Gustavo Yepes, Sergey V. Pilipenko.
MNRAS 491, 1531, 2020

16. The orientation of planes of dwarf galaxies in the quasi-linear universe.
N. Libeskind, **E. Carlesi**, O. Müller, M. Pawlowski, Y. Hoffman, H. Courtois, R. B. Tully, S. Gottlöber, M. Steinmetz, A. Knebe, J. Sorce.
MNRAS 490, 3786, 2019

15. Partitioning the Universe into gravitational basins using the cosmic velocity field.
D. Alexandra, H. Courtois, F. Dupont, F. Denis, R. Graziani, Y. Copick, D. Pomarede, N. Libeskind, **E. Carlesi** B. Tully, D. Guinet.
MNRAS 489, L1-L6, 2019

14. Cosmic-Ray Anisotropy from Large Scale Structure and the effect of magnetic horizons.
N. Globus, T. Piran, Y. Hoffman, **E. Carlesi**, D. Pomaréde.
MNRAS 484, 4167, 2019

13. Dark Matter halo simulations: verifying the Entropy approach to the Core-Cusp problem.
M.V. Tkachev, S.V. Pilipenko, **E. Carlesi**.
Astronomy Reports, 2019, Vol. 63, No. 5, pp. 372-377 (Astronomičeskij Žurnal 96, N.5, 1-7, 2019)

12. The quasi-linear nearby Universe.
Y. Hoffman, **E. Carlesi**, D. Pomaréde, B. Tully, H. Courtois, S. Gottlöber, N. Libeskind, J. Sorce, G. Yepes.
Nature Astronomy 2, 680, 2018

11. The dynamics of the Local Group as a probe of Dark Energy and Modified Gravity.

E. Carlesi, D.F. Mota, H.A. Winther.
MNRAS 466, 4813, 2017

10. Constraining the mass of the Local Group.
E. Carlesi, Y. Hoffman, J. Sorce, S. Gottlöber.
MNRAS 465, 4886, 2017

9. The tangential velocity of M31: CLUES from constrained simulations.
E. Carlesi, Y. Hoffman, J. Sorce, S. Gottlöber, G. Yepes, H. Courtois, B. Tully.
MNRAS Letters, 460-1, 5, 2016

8. Constrained Local UniversE Simulations: A Local Group Factory.
E. Carlesi, J. Sorce, Y. Hoffman, S. Gottlöber, G. Yepes, N. Libeskind, S. Pilipenko, A. Knebe, H. Courtois, B. Tully, M. Steinmetz.
MNRAS 458, 900, 2016

7. Cosmicflows constrained local universe simulations.
J. Sorce, S. Gottloeber, M. Steinmetz, Y. Hoffman, B. Tully, H. Courtois, D. Pomarede, **E. Carlesi**.
MNRAS 455, 2078, 2016

6. Hidden from view: Coupled dark sector physics and small scales.
P. Elahi, G. F. Lewis, C. Power, **E. Carlesi**, A. Knebe.
MNRAS 452, 1341, 2015

5. On the observability of coupled dark energy with cosmic voids.
P. Sutter, **E. Carlesi**, A. Knebe, B. Wandelt.
MNRAS 446, 1, 2015

4. Hydrodynamical simulations of coupled and uncoupled Quintessence models - II. Galaxy clusters.
E. Carlesi, A. Knebe, G.F. Lewis, G. Yepes.
MNRAS 439, 2958, 2014

3. Hydrodynamical simulations of coupled and uncoupled Quintessence models - I. Halo properties and the cosmic web.
E. Carlesi, A. Knebe, G.F. Lewis, S. Wales, G. Yepes.
MNRAS 439, 2943, 2014

2. N-body simulations of a Vector Dark Energy model.
E. Carlesi, A. Knebe, G. Yepes, S. Gottlöber, A. Maroto, J. Beltran.
MNRAS 425, 669, 2012

1. High-z massive clusters and Vector Dark Energy.
E. Carlesi, A. Knebe, G. Yepes, S. Gottlöber, A. Maroto, J. Beltran.
MNRAS 418, 2715, 2011