

# Andrea Cipollone

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Email: andrea.cipollone@cmcc.it

## EDUCATION

- Ph.D. in Theoretical Physics,* 2013  
@"Sapienza" University of Rome (IT)/University of Surrey (UK)
- Master Degree in Theoretical Physics* 2009  
@"Sapienza" University of Rome (IT)  
Final Grade: *magna cum laude*
- Bachelor Degree in Computational Physics* 2006  
@"Sapienza" University of Rome (IT)  
Final Grade: *magna cum laude*

## PROFESSIONAL EXPERIENCE

- Junior Scientist* Currently  
@CMCC (IT), Ocean modeling and Data Assimilation division (ODA)  
topics:
  - Development of a (hybrid) parallel version of CMCC assimilation system that handles global ocean analysis at eddy resolution
  - Development of a 3D detection system for mesoscale instabilities
  - Technical Responsible for the production of Global Ocean Reanalysis within the framework of GLORAN.
- Research Fellow* 2014  
@University of Surrey (UK), Theoretical Physics Group  
topics:
  - Design and implementation of parallel algorithms for solving partial-differential equation (N-body Schroedinger equation) transformed in an eigenvalue problems .

## RECENT PROJECTS

- MOVES*, IS CRA C project 2018, Principal Investigator  
topic: "Mesoscale Ocean Variability in the European Seas"  
award: 100 000 core-hours @MARCONI Broadwell cluster
- GLORAN*, CMEMS tender 2018, Technical Responsible  
topic: "Production of a Global Ocean Reanalysis "
- ROMEO*, PRACE project 2017, Collaborator  
topic: "Understanding the role of mesoscale eddies in the global ocean"  
award: 67 000 000 core-hours @MARCONI KNL cluster
- ADVICE*, IS CRA B project (CINECA) 2017, Collaborator  
topic: "Advances in eddy-resolving ocean modelling with the NEMO system"

award: 1 500 000 core-hours @MARCONI Broadwell cluster

ARGOF, ISCRA C project (CINECA) 2017, Collaborator  
topic: "Assessing the impact of the horizontal Resolution of data assimilation on  
Global Ocean eddy-resolving Forecasts"  
award: 200 000 core-hours @MARCONI Broadwell cluster

GEMINA P42-43, MIUR project 2015, Collaborator  
topic:"Servizio preoperativo di monitoraggio e previsione globale con la validazione  
delle analisi e previsioni oceanografiche"

## TOPICAL COURSES ATTENDED

*Crash Course on Data assimilation* 2018  
@ NERSC, Bergen, NO  
*Data assimilation training course* 2018  
@ ECMWF, Reading, UK  
*High-performance computing school* 2012  
@ European Center of Theoretical studies (ECT\*), Trento, IT

## TEACHING EXPERIENCE

*Exercises for course in "Quantum Mechanics"* 2010  
*Exercises for course in "Relativistic Quantum Mechanics"* 2011  
@ Physics Department, "Sapienza" Universita' di Roma, IT

## COMPUTER SKILLS

*Programming Languages* employed in published works:

- Fortran, C and C++
- R language, Mathematica
- Parallel Programming ( MPI library, OpenMP API )

*Other programming languages:* HTML5, Python, Javascript

## LANGUAGES

*Italian:* Mother Tongue

*English:*

Understanding		Speaking		Writing
Listening	Reading	Spoken interaction	Spoken production	
C1	C1	C1	C1	C1

Common European Framework of Reference (CEF) level

## PEER- REVIEWED PUBLICATIONS

- o A. Storto, P. Oddo, **AC**, I. Mirouze, & B. Lemieux-Dudon, "Extending an oceanographic variational scheme to allow for affordable hybrid and four-dimensional data assimilation", **Ocean Modelling**,128,2018,67-86 (2018)

- A. Storto, S. Masina, S. Simoncelli, D. Iovino, **AC**, M. Drevillon, Y. Drillet, K. von Schuckman, L. Parent, G. Garric, E. Greiner, C. Desportes, H. Zuo, M. A. Balmaseda, K. A. Peterson, "The added value of the multi-system spread information for ocean heat content and steric sea level investigations in the CMEMS GREP ensemble reanalysis product", **Climate Dynamics**,1-26 (2018)
- **AC**, S. Masina, A. Storto & D. Iovino, " Benchmarking the mesoscale variability in global ocean eddy-permitting numerical systems",**Ocean Dynamics**, 67 (10), 1313 (2017)
- V. Stepanov, D. Iovino, S. Masina, A. Storto & **AC**, "Observed and simulated variability of the Atlantic Meridional Overturning Circulation at 41 N",**J. Marine Systems**,164, 42 (2016)
- D. Iovino, A.Storto, S.Masina, **AC** & V.Stepanov "A 1/16 degree eddying simulation of the global NEMOv3.4 sea ice-ocean system ", **Geosci. Model Dev.** , 9, 2665, (2016)
- V. Stepanov, D. Iovino, S. Masina, A. Storto & **AC**, "The impact of horizontal resolution of density field on the calculation of the Atlantic meridional overturning circulation at 34S", **J. Geophys. Res. Oceans**, 121, 4323 (2016)
- V. Stepanov, D. Iovino, S. Masina, A. Storto & **AC**, "Methods of calculation of the Atlantic meridional heat and volume transports from ocean models at 26.5 degree N ", **J. Geophys. Res. Oceans**, 121, 1459 (2016)
- **AC**, C. Barbieri & P. Navrátil, "Chiral three-nucleon forces and the evolution of correlations along the oxygen isotopic chain", **Phys. Rev. C** 92, 014306 (2015)
- M. Rosenbusch, P. Ascher, D. Atatasov, C. Barbieri, D. Beck, K. Blaum, Ch. Borgmann, M. Breitenfeldt, R.B. Cakirli, **AC**, S. George, F. Herfurth, M. Kowalska, S. Kreim, D. Lunney, V. Manea, P. Navratil, D. Neidherr, L. Schweikhard, V. Soma, J. Stanja, F. Wienholtz, R. N. Wolf, & K. Zuber "Measurements of the exotic isotopes  $^{52,53}\text{K}$  probe the  $N=32$  shell closure below the magic  $Z=20$ ",**Phys. Rev. Lett.** 114, 202501 (2014)
- V. Soma, **AC**, C. Barbieri, P. Navratil & T. Duguet "Leading chiral three-nucleon forces along isotope chains in the calcium region", **Phys. Rev. C** 89, 061301 (2014)
- A. Carbone, **AC**, C. Barbieri, A. Rios & A. Polls "Self-consistent Green's functions formalism with three-body interactions", **Phys. Rev. C** 88, 054326 (2013)
- **AC**, C. Barbieri & P. Navratil, "Isotopic chains around oxygen from evolved chiral two- and three-nucleon interactions", **Phys. Rev. Lett.** 111, 062501 (2013)
- F. Flavigny, A. Gillibert, L. Nalpas, A. Obertelli, N. Keeley, C. Barbieri, D. Beaumel, S. Boissinot, G. Burgunder, **AC**, A. Corsi, J. Gibelin, S. Giron, J. Guillot, F. Hamache, V. Lapoux, A. Matta, E. C. Pollacco, R. Raabe, M. Rejmund, N. de Séville, A. Shrivastava, A. Signoracci, and Y. Utsuno, "Limited Asymmetry Dependence of Correlations from Single Nucleon Transfer", **Phys. Rev. Lett.** 110, 122503 (2013)
- O. Benhar, **AC** & A. Loreti, "Weak response of neutron matter at low momentum transfer", **Phys. Rev. C** 87, 014601 (2013)
- O. Benhar & **AC** "Implementation of the Nambu, Jona-Lasinio model in hybrid stars", **Astronomy & Astrophysics** 525, L1 (2011)

Conference Proc.s  
&  
Research Papers

- D. Iovino, A.Storto, S.Masina, **AC** & V.Stepanov "GLOB16, the CMCC global mesoscale-eddy ocean", **CMCC, Research Papers Issue RP0247** (2014)
- C. Barbieri, V. Soma, **AC**, P. Navratil & T. Duguet "Three-nucleon forces in neutron rich isotopes", Conference Proceedings ARIS2014 (2014)
- V. Soma, C. Barbieri, **AC**, T. Duguet & P. Navrátil "Three-nucleon forces in exotic open-shell isotopes", **EPJ Proceedings of INPC** 02005 (2013)

- o C. Barbieri, AC, V. Somá, T. Duguet & P. Navrátil, "*Toward the Ab-initio Description of Medium Mass Nuclei*", Contribution to Summary Report of EURISOL Topical and Town Meetings, [arXiv:1211.3315](https://arxiv.org/abs/1211.3315), (2012)

## Popular Science

- o AC & A. Valli, [COLOR SUPERCONDUCTIVITY IN COMPACT STARS: THE STRANGE WORLD OF THE DENSEST OBJECT IN THE UNIVERSE](#) (2012). Italian version only, magazine: Accastampato, website: [www.accastampato.com](http://www.accastampato.com)

## ACCADEMIC PRESENTATIONS

- o Talk title : "*3D characterization of eddy activities in global ocean eddy-permitting re-analysis* ", 5th International Conference on Reanalysis (ICR5), 2017, @Angelicum University, Rome (IT)
- o Talk title : "*Assimilating SST observations in global ocean system at 1/16 resolution* ", SOSTA meeting, 2017, @INGV, Bologna (IT)
- o Talk title : "*Paving the way towards a fully operational global ocean eddying forecasting system*", 7th China-Italy Collaboration Workshop, 2017, @Accademia delle Scienze, Rome (IT)
- o Talk title : "*Benchmarking mesoscale variability in global eddy-permitting simulations against satellite-derived data*", Nonlinear processes in oceanic and atmospheric flows, 2016, @ICMAT, Madrid (SP), [Slides](#)
- o Talk title : "*Towards a fully operational eddying Global Forecasting System II (GOFS16)*", NEMO Users Meeting, 2016, @CMCC, Lecce (IT)
- o Talk title : "*Towards a fully operational eddying Global Forecasting System I (GOFS16)*", 8th International Workshop on Modeling the Ocean (IWMO), 2016, @Bologna University, Bologna (IT)
- o Talk title : "*Mixed Green Function-Coupled Cluster formalism with 3NF. Application to Oxygen isotopes*", Three-Body Forces: from Matter to Nuclei, 2014, @European Center of Theoretical studies (ECT\*), Trento (IT) [Slides](#)
- o Talk title : "*Three-Nucleon Forces and Neutron Driplines Around the Oxygen Isotopic Chain*", Correlations in exotic nuclear systems, 2013, @Institute of Physics (IoP), Daresbury (UK) [Slides](#)
- o Talk Title : "*Three-Body Forces in Green's Function Theory and First Application to Isotopic Chains*", Computational and Theoretical Advances for Exotic Isotopes in the Medium Mass Region, 2013, @Institute of Nuclear Theory (INT), Seattle (USA) [Slides](#)
- o Talk Title: "*Effects of three-nucleon force on Oxygen Isotopic chain*", FUSTIPEN meeting, 2013, @Grand Accélérateur National d'Ions Lourds (GANIL), Caen (FR) [Slides](#)
- o Talk title: "*Neutrino opacity in neutron matter*", INFN-MB31 collaboration, 2011, @European Center of Theoretical studies (ECT\*), Trento (IT) [Slides](#)
- o Talk Title: "*Neutrino interaction in neutron star matter*", Nuclear Physics School "Raimondo Anni", 2011, @Otranto (Italy) [Slides](#)