

## PERSONAL INFORMATION

Cocetta Francesco

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## EDUCATION

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- October 2017 -      PhD in Computational Fluid Dynamics  
Loughborough University (UK)  
The Wolfson School of Mechanical, Electrical and Manufacturing Engineering  
Thesis title: *A parallel unstructured mesh model for simulations of stratified flows*  
Supervisor: Prof. J. Szmelter  
Currently under review
- October 2014 - July 2017      Master Degree in Physics  
Curriculum: Earth and Environmental Physics  
University of Trieste  
Thesis title: *Analysis of the Atmospheric Boundary Layer Fields. Comparison between models and measurements*  
Supervisors: D. Giaiotti, G. Bonafé  
Mark: 110/110
- October 2010 - July 2014      Bachelor Degree in Physics  
University of Trieste  
Thesis title: *Seasonal Modulation of Antarctic Seismicity*  
Supervisors: Dr. A. Peresan, Prof. G.F. Panza

## TRAINING

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- September 2020      Annual seminar 2020  
ECMWF, European Centre for Medium-Range Weather Forecasts  
14-18 September 2020, Reading, UK
- March 2020      Advanced numerical methods for Earth system modelling (Virtual course)  
hosted by ECMWF, European Centre for Medium-Range Weather Forecasts  
9-12 March 2020, Reading, UK
- December 2019      School on Numerical Methods for Parallel CFD  
hosted by CINECA, Italian inter-university Consortium for scientific research.  
2-6 December 2019, Roma.
- May 2018      27th Summer School on Parallel Computing  
hosted by CINECA, Italian inter-university Consortium for scientific research.  
14-25 May 2018, Bologna.

## WORK EXPERIENCE

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- April 2021 - Post-doc researcher  
Update of the GLOB16 configuration of the NEMO ocean model to the version V4.2  
Euro-Mediterranean Center on Climate Change (CMCC)  
Ocean and Data Assimilation (ODA) Division  
via Berti Pichat 6/2, 40127 Bologna (BO), Italy
- January 2018 - March 2020 Graduate Teaching Assistant  
Dynamics and Heat Transfer labs, and support on Ballistics computational practice  
The Wolfson School of Mechanical, Electrical and Manufacturing Engineering  
Loughborough University  
Loughborough, Leicestershire, LE11 3TU, UK
- October 2016 - November 2016 Internship  
Simulations of pollutant dispersion in the atmosphere with SPRAY model  
CRMA - ARPA FVG (Regional Centre of Environmental Modeling of the Regional agency for environmental protection of Friuli-Venezia Giulia)  
via Cairoli 14, 33057 Palmanova (UD), Italy
- October 2012 - December 2012 Internship  
Basics of geophysical exploration  
O.G.S. - National Institute of Oceanography and Experimental Geophysics  
borgo Grotta Gigante 42/c, 34010 Sgonico (TS), Italy

## SCIENTIFIC ACHIEVEMENTS

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### *Peer-reviewed publications and conference papers:*

Gillard M., Cocetta F., Szmelter J., *Preconditioning elliptic operators in high-performance all-scale atmospheric models on unstructured meshes*, in preparation.

Cocetta F., Gillard M., Szmelter J., Smolarkiewicz P.K., *Stratified flows past a sphere at moderate Reynolds numbers*, Comput. Fluids (under review), doi: <http://arxiv.org/abs/arXiv:2101.06807>

Cocetta F., Szmelter J., Gillard M., *Simulations of stably-stratified flow past two spheres at  $Re=300$* , Phys. Fluids 33 (2021) 046602, doi: <https://doi.org/10.1063/5.0044801>

Cocetta F., Gillard M., Szmelter J. (2020), *Numerical characterisation of stably stratified flows past spheres*. Loughborough University. Contribution to UKACM (UK Association for Computational Mechanics) Conference 2020. doi: <https://doi.org/10.17028/rd.lboro.12095997.v1>.

### *Conferences and seminars:*

Cocetta F., Gillard M., Szmelter J. (2020), *Numerical simulations of stably stratified flows past spheres*. ECCOMASS Congress 2020 & 14th WCCM - Rescheduled online on 11-15 January 2021. Link to the presentation: <https://slideslive.com/38943653/numerical-simulations-of-stably-stratified-flows-past-spheres>.

Cocetta F., Szmelter J., Gillard M. (2019), *Accelerating NFT finite-volume integrators - An MPI parallelization of the flow past sphere test case*. Internal conference at the Wolfson School of Mechanical, Electrical and Manufacturing Engineering, Loughborough.

Cocetta F., Cao Z., Gillard M., Szmelter J. (2018), *NFT integration on unstructured meshes: Flows past obstacles*. The 6th International EULAG Users Workshop "Efficient forward-in-time methods for geophysical research and all-scale weather prediction", Warsaw. <https://tinyurl.com/yarnzuqq>.

Cocetta F. (2016), *Evaluation of odour-prone areas in regional district, with particular attention to disadvantaged areas. Sensitivity study on SPRAY Lagrangian model*. Internal seminar in ARPA FVG (Regional agency for environmental protection of Friuli-Venezia Giulia). <https://tinyurl.com/yajdy3lt>

Cocetta F., Peresan A., Panza G.F. (2015), *Competing/collaborative effect between snow-ice load and tectonic forces modulates large earthquakes occurrence*. National symposium "Il Pianeta Dinamico: sviluppi e prospettive a 100 anni da Wegener", Firenze. Rend. Online Soc. Geol. It, Suppl n. 2 al Vol.35, 104.

*Co-author of contributions to international meetings:*

Gillard M., Szmelter J., Cocetta F. (2020), *Towards a high-performance nonhydrostatic dynamical core for NWP at exascale*. ECCOMASS Congress 2020 & 14th WCCM - Rescheduled on 11-15 January 2021

Giaiotti D., Bonafè G., Cocetta F., Gallai I., Ganesini E., Goglio A. C., Montanari F., Stel F. (2017), *Reliability in modelling extreme precipitation rain rates supports in progress strategies for the improvement of operational severe weather forecasts and simulations of climate change scenarios*. EMS Annual Meeting Abstracts, Vol, 14, EMS2017-161.

Peresan A., Cocetta F., Panza G.F. (2015), *Seasonal modulation of seismicity: The competing/collaborative effect of snow and ice load*. 26th IUGG General Assembly, Prague.

*Poster:*

Cocetta F. (2020), *Developments and applications of NFT-FV integrators*. Contribution to the training course "Advanced numerical methods for Earth system modelling" at ECMWF, Reading. <https://tinyurl.com/ya6k3fse>.

Spring 2020

*Visiting researcher grant*

Advanced Study Graduate Visitor Program (GVP) at NCAR - National Center for Atmospheric Research, Boulder, Colorado (USA). Visit cancelled due to COVID19 pandemic.

## PERSONAL SKILLS

Mother tongue(s)

Italian

Other language(s)

English

UNDERSTANDING		SPEAKING		WRITING
Listening	Reading	Spoken interaction	Spoken production	
C1	C1	C1	C1	C1

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2: Proficient user  
Common European Framework of Reference (CEF) level

Computing skills

Programming: Fortran language, MPI/OpenMP libraries, R language, Phyton, and Bash scripting in HPC environment.

Graphical and scripting tools: GAMBIT mesh generation software, Tecplot, Gnuplot, ggplot R package, basics of GMT, and  $\LaTeX$ .

Desktop applications: MS Word, MS Excel, MS PowerPoint,  $\LaTeX$ .

Numerical models: NFT finite-volume integrators, SPRAY dispersion model, SURFPRO boundary layer pre-processor.

Statistical computing: R language.