

## CURRICULUM VITAE ET STUDIORUM

Annalisa Cherchi

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| <p><b><u>General info:</u></b><br/>Born 13/07/1974 in Ravenna (Italy)<br/>Nationality: Italian<br/>Mother of Leonardo (born on 23/04/2015)</p> <p><b><u>Foreign Languages:</u></b> English (good) and French (from high school).</p> | <p><b><u>Contact:</u></b><br/>Mobile: 347 1271642<br/>E-mail: a.cherchi@isac.cnr.it (work) and annalisa.cherchi@gmail.com (private)</p> |
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### **Academic background:**

**PhD** in Geophysics in 2004 at Bologna University (Italy) with an English thesis titled: “The Asian monsoon system and its teleconnections” with Dr Antonio Navarra as tutor. Degree in Physics in 1998 at Bologna University (Italy) with a thesis (in Italian) titled: “Modelli idealizzati della circolazione monsonica (Idealized models of monsoon circulation)”.

### **Positions held:**

**April 2020 – present** Senior scientist at Institute for Atmospheric and Climate Science (ISAC-CNR) in Bologna. **July 2000 – March 2020** Technical Collaboration for Research at National Institute of Geophysics, UO Aeronomy (then National Institute of Geophysics and Volcanology, Roma2, Dynamic Climatology) – permanent position since September 2003. **2006 - 2019** contribution (in service from INGV) as scientist (Junior scientist from 2006-2010) to Foundation CMCC (since January 2015 in charge of the Earth System Modelling Unit) in Bologna Italy. Principal Investigator for CMCC activities in H2020 BlueAction (Dec 2016-present), H2020 INDO-MARECLIM (2012-2015), FP7 CLARIS-LPB (2008-2012) about Arctic sea-ice changes and Northern Hemisphere climate, Indian monsoon and climate variability over South East South America, respectively. **2012 - 2013** (1 year) visiting scientist at IPRC (Hawaii Univ) working with Dr H Annamalai on the relationship between the Indian summer monsoon and the summer climate in the Mediterranean (monsoon-desert) in CMIP5 models. **Jan 1999 – Jun 2000** Research Collaborations at IMGA-CNR and at IGM-CNR (Bologna) mostly on tools to study climate variability and software management to analyze Mediterranean Sea data, respectively.

### **Other roles:**

Member of the Steering Committee of the “Global Monsoon Model Intercomparison Program (GMMIP)” within the framework of the next coupled models’ inter-comparison (CMIP6);  
Member of the scientific committee of the AISAM2021 CN3 (<https://congresso.aisam.eu/>)  
Abilitazione ASN2018: Astronomia, astrofisica, fisica della terra e dei pianeti (Fascia II, 29/03/2021-29/03/2030); Geofisica (Fascia II, 12/04/2021 – 12/04/2030)  
Feb 2018 – Aug 2021: Lead Author for the IPCC AR6 WGI report (Chapter 8, “Water cycle changes”, contributions to Technical Summary and Summary for Policymakers).

### **Expertise:**

My main expertise is on tropical climate variability in the Indo-Pacific region, dominated by the Asian summer monsoon. I contributed to monsoon studies covering a wide range of aspects, like the relationship with the Indian Ocean, the impact of increased horizontal resolution, the role of increased atmospheric carbon dioxide concentration, including monsoon predictability. I contributed to the C20C (Climate of the 20th century) CLIVAR framework for the study of the connection between the Asian summer monsoon and ENSO. Recently I explored the relationship between the South Asian monsoon and the summer mean climate over the Mediterranean region in CMIP5 simulations. Other areas of my expertise cover the study of the climate system and the

processes associated with climatic states different from the present, as well as aspects of climate variability and extremes in South East South America. I have also expertise in computational global climate modelling and while at CMCC I coordinated the activities to generate the next generation of CMCC earth system model to contribute to forthcoming CMIP efforts.

**Editorial & review activities:** **Reviewer** since 2004 for many peer-reviewed journals including *Clim Dyn*; *ERL*; *GRL*; *Int J Climatol*; *J Clim*; *Nature*. **Associate Editor** for *Annals of Geophysics* (March 2013 - present); for *Meteorological Applications* (March 2019 – present); for *International Journal of Climatology* (March 2019 – present).

**Teaching activities:**

**Lecturing (PhD):** Courses within Science and Management of Climate Change (SGCC) PhD program at Università di Venezia, Ca' Foscari: "General circulation models: atmosphere" (2013) and "Introduction to the atmospheric sciences" (2008-2011). **Co-advisor of bachelor theses:** Zappa G. (2007); Cadau M (2019) **Co-advisor of PhD theses:** Lecci R (2012). **Supervisor of postdoctoral fellows:** within CLARIS-LPB and INDO-MARECLIM EU projects, Stefano Materia (2009; 2014-2015); Laura Zamboni (2009-2010); Satyaban Bishoy Ratna (2013-2014); Miriam D'Errico (2014-2015)

**Peer-reviewed publications:**

1. Arias PA, Bellouin N, Coppola E, Jones RG, Krinner G, Marotzke J, Naik V, Palmer MD, Plattner GK, Rogelj J, Rojas M, Sillman J, Strovelmo T, Thorne PW, Trewin B, Achuta Rao K, Adhikary B, Allan RP, Armour K, Bala G, Barimalala R, Berger S, Canadell JG, Cassou C, Cherchi A, Collins W, Collins WD, Connors SL, Corti S, Cruz F, Dentener FJ, Dereczynski C, Di Luca A, Diongue Niang A, Doblas-Reyes FJ, Dosio A, Douville H, Engelbrecht F, Eyring V, Fischer E, Forster P, Fox-Kemper B, Fuglestedt JS, Fyfe JC, Gillet NP, Goldfarb L, Gorodetskaya I, Gutierrez JM, Hamdi R, Hawkins E, Hewitt HT, Hope P, Islam AS, Jones C, Kaufman DS, Kopp RE, Kosaka Y, Kossin J, Krakovska S, Lee J-Y, Li J, Mauritsen T, Maycock TK, Meinshausen M, Min S-K, Monteiro PMS, Ngo-Duc T, Otto F, Pinto I, Pirani A, Raghavan K, Ranasinghe R, Ruane A, Ruiz L, Salle JB, Samset BH, Sathyendranath S, Seneviratne SI, Sorrenson AA, Szopa S, Takayabu I, Treguier AM, van den Hurk B, Vautard R, von Schuckmann K, Zaehle S, Zhang X, Zickfeld K (2021) Technical Summary. In: *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Masson-Delmotte V, Zhai P, Pirani A, Connors SL, Pean C, Berger S, Caud N, Chen Y, Goldfarb L, Gomis MI, Huang M, Leitzell K, Lonnoy E, Matthews JBR, Maycock TK, Waterfield T, Yelekci O, Yu R, Zhou B (eds). Cambridge University Press (In press)
2. Douville H, Raghavan K, Renwick J, Allan RP, Arias PA, Barlow M, Cerezo-Mota R, Cherchi A, Gan TY, Gergis J, Jiang D, Khan A, Pokam Mba W, Rosenfeld D, Tierney J, Zolina O (2021) Water cycle changes. In: *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Masson-Delmotte V, Zhai P, Pirani A, Connors SL, Pean C, Berger S, Caud N, Chen Y, Goldfarb L, Gomis MI, Huang M, Leitzell K, Lonnoy E, Matthews JBR, Maycock TK, Waterfield T, Yelekci O, Yu R, Zhou B (eds). Cambridge University Press (In press)
3. IPCC, 2021: Annex IV: Modes of variability. Cassou C, Cherchi A, Kosaka Y (eds). In: *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Masson-Delmotte V, Zhai P, Pirani A, Connors SL, Pean C, Berger S, Caud N, Chen Y, Goldfarb L, Gomis MI, Huang M, Leitzell K, Lonnoy E, Matthews JBR, Maycock TK, Waterfield T, Yelekci O, Yu R, Zhou B (eds). Cambridge University Press (In press)

4. IPCC, 2021: Annex V: Monsoons. Cherchi A, Turner A (eds). In: *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Masson-Delmotte V, Zhai P, Pirani A, Connors SL, Pean C, Berger S, Caud N, Chen Y, Goldfarb L, Gomis MI, Huang M, Leitzell K, Lonnoy E, Matthews JBR, Maycock TK, Waterfield T, Yelekci O, Yu R, Zhou B (eds). Cambridge University Press (In press)
5. Cherchi A, Terray P, Ratna SB, Sankar S, Sooraj KP, Behera S (2021) Indian Ocean Dipole influence on Indian summer monsoon and ENSO: a review. Chapter 8 in *Indian summer monsoon variability (El Nino teleconnections and beyond)*, Chowdary JS, Parekh, a, Gnanaseelan (eds). Elsevier, ISBN: 978-0-12-822402-1 <https://doi.org/10.1016/B978-0-12-822402-1.00011-9>
6. Sooraj KP, Terray P, Cherchi A (2021) South Asian summer monsoon and subtropical deserts. Chapter 15 in *Indian summer monsoon variability (El Nino teleconnections and beyond)*, Chowdary JS, Parekh, a, Gnanaseelan (eds). Elsevier, ISBN: 978-0-12-822402-1 <https://doi.org/10.1016/B978-0-12-822402-1.00015-6>
7. Ratna SB, Cherchi A, Osborn TJ, Joshi M, Uppara U (2021) The extreme positive Indian Ocean dipole of 2019 and associated Indian summer monsoon rainfall response. *Geophys Res Lett* e2020GL091497 <https://doi.org/10.1029/2020GL091497>
8. Allan, RP, Barlow M, Byrne MP, Cherchi A, Douville H, Fowler HJ, Gan TY, Pendergrass A, Rosenfeld D, Swann ALS, Wilcox LJ, Zolina O (2020) Advances in understanding large-scale responses of the water cycle to climate change. *Ann of NY Acad Sci* <https://doi.org/10.1111/nyas.14337>
9. Barcikowska MJ, Kapnick SB, Krishnamurty L, Russo S, Cherchi A, Folland CK (2020) Changes in the future summer Mediterranean climate: contribution of teleconnections and local factors. *Earth Sys Dyn* 11: 161-181 <https://doi.org/10.5194/esd-11-161-2020>
10. Scoccimarro E, Gualdi S, Bellucci A, Peano D, Cherchi A, Vecchi GA, Navarra A (2020) The typhoon-induced drying of the Maritime Continent. *PNAS* [www.pnas.org/cgi/doi/10.1073/pnas.1915364117](http://www.pnas.org/cgi/doi/10.1073/pnas.1915364117)
11. Liang Y-C, Kwon Y-O, Frankignoul C, Danabasoglu G, Yeager S, Cherchi A, Gao Y, Gastineau G, Ghosh R, Matei D, Mecking JV, Peano D, Suo L, Tian T (2020) Quantification of the Arctic sea-ice driven atmospheric circulation variability in coordinated large ensemble simulations. *Geophys Res Lett* 47: e2019GL085397 <https://doi.org/10.1029/2019GL085397>
12. Rahaman H, Srinivasu U, Panickal S, Durgadoo JV, Griffies SM, Ravichandran M, Bozec A, Cherchi A, Voldoire A, Sidorenko D, Chassignet EP, Danabasoglu G, Tsujino H, Getzlaff K, Ilicak M, Bentsen M, Long MC, Fogli PG, Farneti R, Danilov S, Marsland SJ, Valcke S, Yeager SG, Wang Q (2019) An assessment of the Indian Ocean mean state and seasonal cycle in a suite of interannual CORE-II simulations. *Oc Modell* <https://doi.org/10.1016/j.ocemod.2019.101503>
13. Cherchi A (2019) Connecting AMOC changes. *Nat Clim Ch (News&Views)* <https://doi.org/10.1038/s41558-019-0590-x>
14. Cherchi A, Fogli PG, Lovato T, Peano D, Iovino D, Gualdi S, Masina S, Scoccimarro E, Matera S, Bellucci A, Navarra A (2019) Global mean climate and main patterns of variability in the CMCC-CM2 coupled model. *JAMES* <https://doi.org/10.1029/2018MS001369>
15. Cherchi A, Ratna SB, Masina S, Storto A, Yang C, Fratianni C, Simoncelli S, Pinardi N (2018) Evaluation of AMIP-type atmospheric fields as forcing for Mediterranean Sea and global ocean reanalyses. *Annals of Geophys* <https://doi.org/10.4401/ag-7793>
16. Cherchi A, Ambrizzi T, Behera S, Freitas ACV, Morioka Y, Zhou T (2018) The response of subtropical highs to climate change. *Current Climate Change Reports* <https://doi.org/10.1007/s40641-018-0114-1>
17. Cherchi A, Kucharski F, Colleoni F (2018) Remote SST forcing on Indian summer monsoon extreme years in AGCM experiments. *Int J Climatol* <https://doi.org/10.1002/joc.5360>

18. Abish B, Cherchi A, Ratna SB (2017) ENSO and the recent warming of the Indian Ocean. *Int J Climatol* <https://doi.org/10.1002/joc.5170>
19. Ratna SB, Ratnam JV, Behera SK, Cherchi A, Wang W, Yamagata T (2017) The unusual wet summer (July) of 2014 in Southern Europe. *Atm Res* 189: 61-68 <https://doi.org/10.1016/j.atmosres.2017.01.017>
20. Cherchi A, Annamalai H, Masina S, Navarra A, Alessandri A (2016) 21st century projected summer mean climate in the Mediterranean interpreted through the monsoon-desert mechanism. *Clim Dyn* <https://doi.org/10.1007/s00382-015-2968-4>
21. Lecci R, Masina S, Cherchi A, Barreiro M (2016) A coupled model study on the Atlantic Meridional Overturning Circulation under extreme atmospheric CO2 conditions. *Annals of Geophysics* <https://doi.org/10.4401/ag-6658>
22. Carril AF, Cavalcanti IFA, Menendez CG, Sorensson A, Lopez-Franca N, Rivera JA, Robledo F, Zaninelli PG, Ambrizzi T, Penalba OC, da Rocha RP, Sanchez E, Bettolli ML, Pessacg N, Renom M, Ruscica R, Solman S, Tencer B, Grimm AM, Rusticucci M, Cherchi A, Tedeschi R, Zamboni L (2016) Extreme events in La Plata basin: A retrospective analysis of what we have learned during CLARIS-LPB project. *Clim Res* doi: 10.3354/cr01374
23. Ratna SB, Cherchi A, Joseph PV, Behera SW, Abish B, Masina S (2016) Moisture variability over the Indo-Pacific region and its influence on the Indian summer monsoon rainfall. *Climate Dynamics* 46(3) 949-965 <https://doi.org/10.1007/s00382-015-2624-z>
24. D'Errico M, Cagnazzo C, Fogli PG, Lau WKM, von Hardenberg J, Fierli F, Cherchi A (2015) Indian monsoon and the elevated-heat-pump mechanism in a coupled aerosol-climate model. *J Geophys Res Atm* <https://doi.org/10.1002/2015JD023346>
25. Colleoni F, Cherchi A, Masina S, Brierley C (2015) Impact of global SST gradients on the Mediterranean runoff changes across the Plio-Pleistocene transition. *Paleoceanography* 30(6) 751-767 <https://doi.org/10.1002/2015PA002780>
26. Cavalcanti IFA, Carril AF, Penalba OC, Grimm AM, Menendez CG, Sanchez E, Cherchi A, Sorensson A, Robledo F, Rivera J, Pantano V, Bettolli LM, Zaninelli P, Zamboni L, Tedeschi RG, Dominguez M, Ruscica R, Flach R(2015) Precipitation extremes over La Plata Basin – Review and new results from observations and climate simulations. *J. of Hydrology* <https://doi.org/10.1016/j.jhydrol.2015.01.028>
27. Alessandri A, Borrelli A, Cherchi A, Materia S, Navarra A, Lee JY, Wang B (2015) Prediction of Indian summer monsoon onset using dynamical sub-seasonal forecasts: effects of realistic initialization of the atmosphere. *Mon Wea Rev* <https://doi.org/10.1175/MWR5D514500187.1>
28. Alessandri A, De Felice M, Zeng N, Mariotti A, Pan Y, Cherchi A, Lee JY, Wang B, Ha KJ, Ruti P, Artale V (2014) Robust assessment of the expansion and retreat of Mediterranean climate in the 21<sup>st</sup> century. *Sci Rep* 4: 7211 <https://doi.org/10.1038/srep07211>
29. Cherchi A, Carril AF, Menendez CG, Zamboni L (2014) La Plata basin precipitation variability in spring: role of remote SST forcing as simulated by GCM experiments. *Clim Dyn* 42: 219-236 <https://doi.org/10.1007/s00382-013-1768-y>
30. Cherchi A, Annamalai H, Masina S, Navarra A (2014) South Asian summer monsoon and the eastern Mediterranean climate: the monsoon-desert mechanism in CMIP5 simulations. *J Clim* 27: 6877-6903 <https://doi.org/10.1175/JCLI-D-13-00530.1>
31. Colleoni F, Masina S, Cherchi A, Iovino D (2014) Impact of orbital parameters and greenhouse gas on the climate of MIS7 and MIS5 glacial inceptions. *J Clim* 27: 8918-8933 <https://doi.org/10.1175/JCLI-D-13-00754.1>
32. Colleoni F, Masina S, Cherchi A, Navarra A, Ritz C, Peyaud V, Otto-Bliesner B (2014) Modeling Northern Hemisphere ice-sheet distribution during MIS5 and MIS7 glacial inceptions. *Clim Past* 10: 269-291 <https://doi.org/10.5194/cp-10-269-2014>
33. Cherchi A, Navarra A (2013) Influenc of ENSO and of the Indian Ocean Dipole on the Indian summer monsoon variability. *Clim Dyn* 41: 81-103 <https://doi.org/10.1007/s00382-012-1602-y>

34. Cherchi A, Masina S, Navarra A (2012) Tropical Pacific-North Pacific teleconnection in a coupled GCM: remote and local effects. *Int J Clim* 32: 1640-1653 <https://doi.org/10.1002/joc.2379>
35. Miyakoda K, Cherchi A, Navarra A, Masina S, Ploshay J (2012) ENSO and its effects on the atmospheric heating processes. *J Meteor Soc Jpn* 90: 35-57 <https://doi.org/jmsj.2012-103>
36. Anderson B, Knight JR, Ringer MA, Yoon JH, Cherchi A (2012) Testing for the possible influence of unknown climate forcings upon global temperature increases from 1950 to 2000. *J Clim* 25: 7163-7172 <https://doi.org/10.1175/JCLI-D-11-00645.1>
37. Barreiro M, Cherchi A, Masina S (2011) Climate sensitivity to changes in ocean heat transport. *J Clim* 24: 5015-5030 <https://doi.org/10.1175/JCI-D-10-05029.1>
38. Cherchi A, Alessandri A, Masina S, Navarra A (2011) Effects of increased CO2 levels on monsoons. *Clim Dyn* 37: 83-101 <https://doi.org/10.1007/s00382-010-0801-7>
39. Anderson BT, Knight JR, Ringer MA, Deser C, Phillips AS, Yoon JH, Cherchi A (2010) Climate forcings and climate sensitivities diagnosed from atmospheric global circulation models. *Clim Dyn* 35: 1461-1475 <https://doi.org/10.1007/s00382-010-0798-y>
40. Alessandri A, Borrelli A, Masina S, Cherchi A, Gualdi S, Navarra A, Di Pietro P, Carril AF (2010) The INGV-CMCC seasonal prediction system: improved ocean initial conditions. *Mon Wea Rev* 138: 2930-2952 <https://doi.org/10.1175/2010MWR3178.1>
41. Zhou T, Wu B, Scaife AA, Bronnimann S, Cherchi A, Fereday D, Fischer AM, Folland CK, Jin KE, Kinter J, Knight JR, Kucharski F, Kusunoki S, Lau NC, Li L, Nath MJ, Nakaegawa T, Navarra A, Pegion P, Rozanov E, Schubert S, Sporyshev P, Voldoire A, Wen X, Yoon JH, Zeng N (2009) The CLIVAR C20C project: which components of the Asian-Australian monsoon circulation variations are forced and reproducible? *Clim Dyn* 33: 1051-1068 <https://doi.org/10.1007/s00382-008-0501-8>
42. Carril AF, Gualdi S, Cherchi A, Navarra A (2008) Heatwaves in Europe: areas of homogeneous variability and links with the regional to large-scale atmospheric and SSTs anomalies. *Clim Dyn* 30: 77-98 <https://doi.org/10.1007/s00382-007-0274-5>
43. Cherchi A, Gualdi S, Behera S, Luo JJ, Masson S, Yamagata T, Navarra A (2007) The influence of tropical Indian Ocean SST on the Indian summer monsoon. *J Clim* 20: 3083-3105 <https://doi.org/10.1175/JCLI4161.1>
44. Cherchi A, Navarra A (2007) Sensitivity of the Asian summer monsoon to the horizontal resolution: differences between AMIP-type and coupled model experiments. *Clim Dyn* 28: 273-290 <https://doi.org/10.1007/s00382-006-0183-z>
45. Cherchi A, Navarra A (2003) Reproducibility and predictability of the Asian summer monsoon in the ECHAM4-GCM. *Clim Dyn* 20: 365-379 <https://doi.org/10.1007/s00382-002-0280-6>

#### **International conferences (last 5 years):**

**2021 Apr 19-30** vpico @VEGU2021 “On the relationship between Indian Ocean Dipole, Indian summer monsoon and ENSO, session OS1.5

**2020 May 4-8** chat @EGU “Internal variability of the Arctic Oscillation and its projections” session CL4.15

**2018 Apr 19th** Talk (invited) @Workshop on the Northern Annular Mode “The role of the Tropics”, IMAU, Utrecht (The Netherlands);

**2017 Oct 17-20** Talk @Numerical modelling, predictability and data assimilation in weather ocean and climate: A symposium honoring the legacy of Anna Trevisan “The South Asian monsoon and the Mediterranean summer: Extreme years and onset”, CNR, Bologna (Italy); **Dec 11-15** Poster @AGU Fall Meeting “Arctic sea-ice and patterns of the Northern Hemisphere atmospheric circulation”, New Orleans (US)

**2016 Jun 13-17** Talk (invited) @ICTP-IITM-COLA Targeted Training Activity (TTA) Towards improved monsoon simulation “The South Asian monsoon and the Mediterranean: a multi-model

analysis” Trieste (Italy); **Jun 07-10** Talks @IWMO "Assessment of atmospheric re-analyses and AMIP experiments to force global and regional ocean re-analyses" and "Issues of the Indian Ocean warming in atmospheric and oceanic global re-analyses" Bologna (Italy)

**2015 Mar 16-18** Talk @CMCC-JAMSTEC symposium on predictability and applicability of climate variations and change "Predictability and teleconnections of South Asian summer monsoon and Indian Ocean: Progresses at CMCC in the framework of the INDO-MARECLIM project" Bologna (Italy)

**2014 27 Apr-02 May** Talk @EGU "South Asian summer monsoon and the eastern Mediterranean climate: the “monsoon-desert mechanism” in CMIP5 simulations" Wien (Austria); **Sep 29-30** Talk @SISC "Linking South Asian summer monsoon and eastern Mediterranean climate in CMIP5 simulations: performance and 21st century projections" Venice (Italy)