

## Candidate

### Executive Council of the International Society for the Advancement of Emergy Research

Term Length: **4 years**

Name: **Francesco Gonella**

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#### Education and positions

- PhD in Physics (University of Padua, 1992).
- Excellence Postdoctorale (Université Laval, Québec City, Canada, 1993-94).
- Visiting Scientist/Professor at the Vanderbilt University (Nashville, USA, 1995), Tokyo Institute of Technology (Tokyo, Japan, 2009-10), University of Florida (Gainesville, 2014).
- Since 2016, Full Professor of Physics at the Ca' Foscari University of Venice, Italy.
- Director of the Centre for the Study of the Systemic Dynamics of Complex Diseases ([www.smacresearch.it](http://www.smacresearch.it)).
- Member, Scientific Board of the Centre for Environmental Humanities (<https://www.unive.it/pag/44234/>).

#### Teaching

- University courses (undergraduate, graduate and PhD) of Physics, Complex Systems and Systems Thinking.
- In 2013, 2015, 2018 Director of the “International School on Emergy Accounting”, Ca' Foscari University.
- Since 2017, lecturer of Environmental Modelling at the School of Environment, Normal Beijing University.
- Since 2022, teacher of the course "Sustainability" for the International College at Ca' Foscari University.
- Lecturer on the topics of Systems Thinking and Emergy analysis for various courses at the Universities of Venice, Padua, Udine, Catania, Turin.
- Supervisor of candidates for Bachelor, Master and PhD degrees on Systems Thinking and Emergy analysis.
- Invited lecturer in Universities in the Unites States, Canada, Germany, France, Japan, India, China.

#### Research

- About 250 publication in International Journals. H-index=41 (2024, Scopus).
- Included in the list of the 2% most influential scientists worldwide in their respective fields, (Elsevier BV, Stanford Univ. 2021, Scopus).<https://doi.org/10.1371/journal.pbio.3000918>).
- Expert Reviewer for both IPCC (Intergovernmental Panel on Climate Change) and IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services).
- High-End Foreign Expert for the Chinese Academy of Science.
- Visiting Scientist at the Vanderbilt University (Nashville, USA) and at the Univ. of Florida (Gainesville, USA).
- Associate Editor for “Frontiers in Sustainable Cities” and “Journal of Environmental Accounting and Management”. Chairman of "Complementing monetary evaluations by means of comprehensive environmental assessment of resources and services. The Emergy Accounting method", Special Session of the 12th Conference of the European Society for Ecological Economics, Budapest, Hungary, June 2017.

#### Recent selected publications

1. Q. Yang, G. Liu, F. Gonella, Q. Wang, S. Chen, Z. Yang (2024). Revisiting mid-long term ecosystem services projections: Integrating the interaction effects of future climate and land use changes. *Fundamental Research*, doi.org/10.1016/j.fmre.2024.02.017
2. L. Conte, J. Prakofjewa, T. Floridaia, A. Stocco, V. Comar, F. Gonella, M. Lo Cascio (2024). Learning from small farmers on potentials and limits for the agroecological transition in Western Sicily: a participatory action research. *Frontiers in Environmental Science* 12:1347915. doi.org/10.3389/fenvs.2024.1347915
3. J.C. Chiaka, G. Liu, H. Li, W. Zhang, M. Wu, Z. Huo, F. Gonella (2024). Land Cover Changes and Management Effectiveness of Protected Areas in Tropical Coastal Area of sub-Saharan Africa. *Environmental and Sustainability Indicators* 22 (2024) 100340. doi.org/10.1016/j.indic.2024.100340

4. L. Conte, F. Gonella, et al. (2023). Modeling cell populations metabolism and competition under maximum power constraints. *PLOS Computational Biology* 19 (11). doi.org/10.1371/journal.pcbi.1011607
5. M. Wu, G. Liu, Gengyuan, F. Gonella, et al. (2023). Does a scaling exist in urban ecological infrastructure? A case for sustainability trade-off in China. *Env. Sci. Poll. Res. Int.* 1. doi.org/10.1007/s11356-023-29275-1
6. D. Padovan, S. Cristiano, F. Gonella (2022). Strategies of socio-ecological transition for a sustainable urban metabolism. *Frontiers in Sustainable Cities* 4, 875912. doi.org/10.3389/frsc.2022.87591
7. W. Zhang, G. Liu, F. Gonella, et al. (2022). Research on Collaborative Management and Optimization of Ecological Risks in Urban Agglomeration. *J. Clean, Prod.* 372, 133735. /10.1016/j.jclepro.2022.133735
8. Q. Yang, G. Liu, F. Gonella, Y. Chen, C. Liu, H. Zhao, Z. Yang (2022). Assessing the temporal-spatial dynamic reduction in ecosystem services caused by air pollution: a near-real-time data perspective. *Resources, Conservation & Recycling* 180, 106205. doi.org/10.1016/j.resconrec.2022.106205
9. F. Gonella, et al. "Emergy Assessment of a sustainable Solar Still for water desalination and purification". Biennial Emergy Conference, 2025. In preparation for submission to *Environments*.
10. L. Conte, V. Comar, F. Surra, F. Gonella. "Agroecological land restoration in the light of energy systems theory". Biennial Emergy Conference, 2025. In preparation for submission to *Ecological Modelling*.
11. F. Surra, L. Conte, A. Romano, F. Gonella. "The ecological modeling of Howard T. Odum and its perspective inheritance in cancer biology and medicine". Biennial Emergy Conference, 2025. In preparation for submission to *Ecological Modelling*.
12. C. Flora, A. Perosa, F. Gonella. "Emergy Accounting and Green Chemistry languages". Biennial Emergy Conference, 2025. In preparation for submission to *Ecological Modelling*.

## **Personal Vision Statement for the Emergy Society**

### **Overall**

I had not the privilege to meet personally HT Odum, but his cultural legacy has been much inspiring me since I have started studying systems thinking and emergy. I do think that there is a conceptual legacy -along with the more "technical" aspects of emergy- still waiting to be fully spread and exploited, requiring the likewise setting up of epistemological aspects, and the Emergy Society should have a fundamental role in this operation. In my opinion, the involvement of communities or scholars not directly working with indicators should help to spread the emergy research approach in various still unexplored fields. Connected to this point, I think that an effort must be made in the field of Higher Education, trying to spread emergy through Conferences and working groups active on that. Another aspect of primary importance is the promotion of studies and using, alongside with the emergy accounting method, the dynamic emergy analysis, aimed to explore the development of suitable simulator of complex systems in the emergy perspective. To summarize, I think that the Emergy Society should not be (only) the room where emergy people meet each other and discuss (very little of that is anyway happening), but the place where other people arrive at, finding a lot of scientific stuff but also the opportunity for a cultural step further. The general points I would like to be addressed by the Emergy Society in the next future are therefore:

- Supporting the standardization and the refining of emergy accounting methodology, along with the continuous updating of database, by promoting data collection and dissemination as well as the sharing of the work in progress.
- Promoting the development of studies dedicated to the practice of dynamic emergy analysis.
- Involving scholars from other disciplines in the emergy debate, deepening the study of its conceptual foundations for the potential cultural importance besides the more scientific aspects.
- Exploring the field of international Higher Education as a possible way for a new outcome of emergy (participation in International Congresses as well as in international working groups).

### **Short term (important priorities)**

- Society website: now the appearance and the functionality are both of quite high level, but we should keep trying to increase its efficacy, most of all by contributing to keep it updated and at the same time spread it to all our respective collaboration networks.
- Plan and rationalize a global action for School organization and location, with the aim at covering in both space (at least North America, South America, Europe and Asia) and time (every year) with some initiative.
- Plan participation in international Conferences and plan organization of Workshops and thematic symposia.
- Support dissemination of emergy by dedicated Special Issues of international Journals.