



## AVVISO

Informo che il **Prof. Michael Ghil** (École Normale Supérieure, Paris e University of California, Los Angeles) terrà, nell'ambito del progetto IPSODES-P.N.R.A. il giorno **Mercoledì 29 Settembre alle ore 11:00 nell'Aula 14 dei locali del Centro Direzionale**, un seminario dal titolo:

### *How I Got to Love Dynamical Systems and Their Bifurcations*

Il seminario potrà essere seguito anche in teleconferenza [cliccando qui](#).

Tutti gli interessati sono invitati a partecipare.

Prof. Stefano Pierini

Napoli, 24 Settembre 2021



## How I Got to Love Dynamical Systems and Their Bifurcations

Michael Ghil

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**Abstract.** As a young man I believed Einstein's (apocryphal?) claim that he didn't achieve the grand unification of all of Nature's forces because of his insufficient mastery of math. So I went to get a Ph.D. in math, which seemed to me to be needed to do any serious work in the physical, natural or even social sciences. In the 1970s, that kind of math at the Courant Institute of Mathematical Sciences in New York was dominated by ordinary and partial differential equations, and by their numerical and functional analysis.

There wasn't much of dynamical systems or their ergodic theory around. But then I became interested in climate and even defining it wasn't possible without these two building blocks of understanding all that moves. So I fell in love with attractors, bifurcations, and the statistics of what happens when regularity competes with chaos. And in this talk I'll try to give you some examples of how that works [1, 2, 3, 4].

### References

- [1] Ghil M (2019) A century of nonlinearity in the geosciences. *Earth and Space Science*, 6:1007-1042, <https://doi.org/10.1029/2019EA000599>.
- [2] Ghil M (2020) Hilbert problems for the climate sciences in the 21st century - 20 years later. *Nonlinear Processes in Geophysics*, 27:429-451, <https://doi.org/10.5194/npg-27-429-2020>.
- [3] Ghil M, Childress S (1987) *Topics in Geophysical Fluid Dynamics: Atmospheric Dynamics, Dynamo Theory and Climate Dynamics*. Springer Science+Business Media, reissued as an eBook, 2012.
- [4] Ghil M, Lucarini V (2020) The physics of climate variability and climate change. *Reviews of Modern Physics*, 92(3):035002, <https://doi.org/10.1103/RevModPhys.92.035002>