Symphony of the uncertainty in three movements

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报告地点：机电工程学院 A507
主办单位：中国矿业大学机电工程学院
智能采矿装备技术全国重点实验室
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报告人简介：Miguel A. F. Sanjuán received a Bachelor's Degree in Physics from the University of Valladolid, Spain, in 1981, where he was awarded the Outstanding Graduation Honor for Undergraduate Studies, and a PhD from the National University for Distance Education (UNED), Madrid, Spain, in 1990, specializing in nonlinear dynamics and chaos. He is currently Professor of Physics at Universidad Rey Juan Carlos (URJC), Madrid, Spain, where he serves as Director of the Research Group on Nonlinear Dynamics, Chaos and Complex Systems. He is the author of numerous research articles and several books, and serves on the editorial boards of various international journals in nonlinear dynamics and chaos. He is Editor-in-Chief of the Journal of Applied Nonlinear Dynamics. He has delivered invited lectures at universities and research centers across Spain, Europe, the USA, Canada, China, Japan, India, Australia, South America, and Africa. He has been a Visiting Research Associate at the Institute for Physical Science and Technology of the University of Maryland, a Visiting Researcher at the University of Tokyo, a Visiting Research Professor at Beijing Jiaotong University, a Visiting Professor at Kaunas University of Technology, Lithuania, and a Guest Professor at Lanzhou University and Zigong University, China. He was also a Fellow of the Japan Society for the Promotion of Science (JSPS) at the University of Tokyo. In 2017, he was a Fulbright Visiting Research Scholar at the University of Maryland. He was the inaugural recipient of the Chieh-Su Hsu Award in 2020 for distinguished scholars in nonlinear dynamics and control, and in 2022 he became the first recipient of the James Yorke Award for his pioneering contributions to nonlinear dynamics and chaos. He is Honorary Professor at Sichuan University of Science and Engineering, Zigong, China, and at Huaqiao University, Xiamen, China. He currently serves as Editor General of the Spanish Physics Society and has been until recently member of the EPJ Scientific Advisory Committee of the European Physical Society. He is a Full Member of the Spanish Academy of Sciences, a Foreign Member of the Lithuanian Academy of Sciences, a Foreign Member of the Serbian Academy of Nonlinear Sciences, and a Regular Member of Academia Europaea — The Academy of Europe.

报告内容简介：

In this presentation, conceived as a symphony in three movements, I will present a coherent overview of key concepts related to uncertainty and unpredictability in nonlinear dynamical systems. The first movement introduces the topological foundations of unpredictability, ranging from indecomposable continua to the emergence of Wada basins. In the second movement, I will focus on a concrete physical example, analyzing the Wada basin structure of the Hénon–Heiles Hamiltonian system and its implications for chaotic scattering and final-state sensitivity. The final movement culminates with the concept of basin entropy as a quantitative measure of unpredictability. I will also discuss recent advances in the use of basin entropy for basin classification and for the systematic detection and analysis of bifurcations in dynamical systems.

欢迎全校师生参加！