

More than 30 years of scientific endeavor have brought us from programming simple models to impressive simulations of dynamic systems. Lattice models like Potts, percolation, fuse, fiber bundle, and growth models, just to name a few, are the prototypes or godfathers of statistical mechanics. With the availability of more powerful tools it became possible to develop these models and apply them on complex topologies, finding important practical applications in socio-technological systems (e.g., opinion dynamics, traffic, communication networks) and to engineering problems (e.g., fracture phenomena, mass transport). In parallel, particle models evolved from a hand full of interacting discs to three dimensional multibillion particle simulations that successfully describe interesting fracture phenomena, granular flow, and even fluid flow for engineering applications. Prof. Dr. Hans Jürgen Herrmann has dedicated his professional life to this journey.

Born in Havana, raised in Bogotá, trained as physicist in Göttingen and Cologne, Hans got fascinated by the possibilities of using late 70's "super" computers for solving open problems in Physics. For more than a quarter of a century, Hans has always created a highly stimulating international and cross-disciplinary environment at his various positions in Paris, Jülich, Stuttgart, Fortaleza, and presently in Zurich. Thanks to his efforts, a community of Computational Physicists emerged bringing new ideas and methods to several different scientific fields.

This EPJ ST issue is dedicated to Hans Herrmann to celebrate his 60th birthday and to pay tribute to his outstanding scientific achievements and his commitment to teaching and education. All papers in this issue have been provided by former collaborators and members of his past and present research groups now spread over 17 countries, who teamed up to review the state-of-art of their field of expertise. The result is a collection of 21 overview articles covering a broad spectrum of different fields. Strongly simplified, one would say that it is all about topology and interactions. The first set of papers demonstrates how these concepts broaden our understanding of society and also how social, technical and biological networks respond to failures. The next set of articles focused on the resulting complex dynamic system behavior from a fundamental, descriptive point of view. Percolation, aggregation, Sol-Gel transitions, granular dynamics, fracture and fragmentation are examples that are covered in more detail in the successive articles. All papers provide a short review of the field with a strong emphasis on new insights and future trends.

We thank Springer, the Executive Publishing Editor, Dr. Christian Caron, and the EPJ ST Scientific Advisory Committee, for making this Special Issue possible. Along with many co-workers, co-students, friends and colleagues we congratulate Hans to his 60th anniversary. Working in the group of Hans was and still is a real privilege – thank you Hans!



Participants at the Dynamic Systems: From Statistical Mechanics to Engineering Applications conference in honor of Hans J. Herrmann's 60th Anniversary, Zurich, January 9–10th, 2014, organized by the Institute for Building Materials, ETH Zurich.