

INDAM MEETING:  
**HYPERBOLIC DYNAMICAL SYSTEMS  
IN THE SCIENCES**

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**Hyperbolic sets and their invariant manifolds in coupled map lattices: regularity and localization properties**

We study coupled map lattices. We develop a formalism that allows to study perturbation theory rather comfortably. The main tool is to identify a class of functions (which we call *decay functions*) that formulate precisely that the dependence on far objects is small and which behave well under composition and other natural operations. Even if not all the arguments in finite dimensions can be adapted, some carefully chosen arguments familiar from finite dimensions can be adapted to the study of infinite systems. (Note that these systems have uncountably many periodic orbits so one cannot maintain at the same time compactness and uniform hyperbolicity).

We apply this methodology to the study of hyperbolic sets and their invariant manifolds, and we conclude persistence of the hyperbolic as well as regularity properties of the invariant manifolds, including precise statements of the decay properties of the invariant manifolds. Other applications of the framework are also possible.

(Joint work with E. Fontich and P. Martin)