Preface Issue 3-2015

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Autonomous dynamical systems are systems of differential equations where the right hand side does not explicitly depend on the independent variable, usually interpreted as time t . In order to find out the state $u(t)$ of the system at time t with initial condition u_0 at time t_0 , one may start with the same initial condition at time 0 and calculate the state $u(t - t_0)$ at time $(t - t_0)$. To investigate and to understand the dynamical behaviour of systems of this type, there exist well established methods and successful concepts, e.g. invariant sets, limit sets and attractors. In the case of *nonautonomous* systems all of these methods, concepts and related issues become more complicated and less research has been carried out. Here, in order to calculate the state $u(t)$ at the present time t one needs indeed to know the starting time t_0 , and not only the elapsed time interval $(t - t_0)$. Hans Crauel and Peter E. Kloeden explain in their survey article “Nonautonomous and random attractors” how the notion and theory of invariant sets, limit sets and attractors has to be extended to nonautonomous dynamical systems. The authors explain at the same time how they have developed a closely related theory of *random* dynamical systems, which are intrinsically nonautonomous.

Moritz Kassmann gives a brief account of recent developments in the area of Dirichlet forms and includes some remarks on the book “Semi-Dirichlet forms and Markov processes” by Yoichi Oshima. Heiko von der Mosel gives an informative summary of Xavier Tolsa’s recent book on “Analytic capacity, the Cauchy transform, and non-homogeneous Calderón-Zygmund theory”. The reviewer has a quite positive opinion of this book. Jean-Claude Yakoubsohn emphasises the dominant role of “Condition” in numerical analysis and reviews the book of the same title written by Peter Bürgisser and Felipe Cucker. Their subtitle is “The geometry of numerical algorithms.”

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