1125-45-2366 **Irene M. Gamba*** (gamba@math.utexas.edu), Department of Mathematics and ICES, 1 University Station C1200, Austin, TX 78712. *The Dynamics of Particle Systems by Boltzmann Type Models.*

We will disc uss recent progress in analytical and numerical methods covering form initial a nd boundary value problems, long time dynamics and stability issues.Interacting particle transport or kinetic collisional modeling was introduced in the last quarter of the nineteenth century by L. Boltzmann and J.C. Maxwell, independently, giving birth to the area of mathematical Statistical Mechanics and Thermodynamics. These types of evolution models concern a class of non-local, and non-linear integro-differential problems whose rigorous mathematical treatment and approximations are still emerging in comparison to classical non-linear PDE theory. Their applications range from rarefied elastic and inelastic gas dynamics including very low temperature regimes for quantum interactions, collisional plasmas and electron transport in nanostructures, to self-organized or social interacting dynamics. Based on a Markovian framework of birth and death processes, under the regime of molecular chaos propagation, their evolution is described by equations of non-linear collisional Boltzmann type. We will discuss recent progress in analytical and numerical methods covering issues on initial and boundary value problems, long time dynamics and stability.

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