Particle interferometry is a method to extract information on the space-time characteristics of sources of particle emission. The method is based on the quantum statistical (anti-)symmetry of the wave-function of identical particles which encodes the space-time information into the measurable two-body and many-body correlation functions.

Presently, particle interferometry provides a unique tool to measure, on the fermi scale of 10^{-15} m, the volume of hot and expanding systems at their freeze-out. Since the total energy is well controlled, one may estimate the energy density reached with the help of the particle interferometry "microscope". Thus one may infer whether the Quark-Gluon Plasma, a new and long time desired state of the strongly interacting matter, has been formed (or not). However, many non-ideal features of the two-particle correlations make the determination of the underlying space-time picture highly non-trivial.

In the last 10 years it turned out that the interpretation of the data becomes increasingly tricky if the source undergoes strong collective dynamics and has a short lifetime. A multi-dimensional analysis of the 2-particle correlator as a function of the relative and total momentum of the pairs is required to separate geometric effects from dynamical ones. Many different model calculations and numerical simulations of correlation functions appeared on the market, and a concentrated experimental effort towards a multidimensional investigation of the correlations in nuclear collisions improved the quality and quantity of the data dramatically.

At the same time experimental efforts to systematically study multi-dimensional HBT interferometry in a large kinematic domain and for various colliding systems from proton-proton to Pb-Pb or Au-Au collisions at CERN SPS and BNL AGS energies are providing extremely stringent tests for the model-builders and showing evidence for unexpected, scaling behaviours in the data.

In summary the field is close to a transition point where a new generation of data will be matched with a new generation of the models. We expect that the tranditionally separated studies which analyse the correlation functions and the invariant momentum distributions independently will have to be merged to determine the model parameters uniquely. We expext that an intense 2-week *work*-shop can provide a unique opportunity for consolidation of ideas and methods as well as to identify the new challenges and the next levels of problems.

For this purpose, we plan to ask a few theoretically inclined experimentalists to summarize the experimental status of particle interferometry in the BNL AGS and CERN SPS heavy ion programme. These data provide the most detailed multi-dimensional analysis of the correlation function. As a feature of the workshop we plan to invite experimetalists to organize the available data on both the correlation functions and the invariant momentum distribution before the workshop in such a manner that direct model comparisons, the testing of new ideas and fitting expressions may become possible during the course of the workshop. Although the main focus shall thus be on the above described hot topics in high energy heavy ion physics, we would like to invite for review talks some of the leading experts working with similar methods in elementary particle physics, medium and low energy heavy ion physics as well as in quantum optics. We expect that these invited review talks will help us in understanding the non-ideal effects and may possibely result in new applications of the methods and techniques developed in various related fields.