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## Gaseous Detectors: Recent Developments and future Perspective's

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Thirty years after the invention of the Multi-Wire Proportional Chamber, and twenty from the first Vienna Wire Chamber Conference, the interest and research efforts devoted to gas detectors are still very conspicuous, as demonstrated by the number of papers submitted to this Conference. Innovative and performing devices have been perfected over the years and used in experiments; more are still being developed today. Amazingly, after one hundred years of continuing studies on gas discharge phenomena, our knowledge on this very complex subject is still improving thanks to the studies motivated by specific instrumental requirements. After a short reminder of the most relevant processes leading to detection (ionization, drift, multiplication, signal induction) I will describe several "tools of trade" that have been developed and are available to model the counting action and to analyze properties of the detectors. As an example, the results of a recent study of the timing properties of Resistive and Parallel Plate Chambers will be discussed. Recent results obtained with the NA49 Time Projection Chamber will be presented as an illustration of the extremely powerful pattern recognition properties that can be achieved with gas detectors for complex events at moderate interaction rates. Introduced ten years ago, and after a substantial effort of development, the Micro-Strip Gas Chamber appears to fulfill the needs of the demanding high luminosity trackers; the major advances in this field will be reported, followed by a discussion on discharge problems encountered and possible solutions. Alternative and potentially more powerful geometries such as the micro-gap, narrow-gap and micro-dot chambers will be described. A new generation of devices exploiting avalanche multiplication in narrow gaps has emerged recently, namely Micromegas, the CAT (Compteur Trous) and the Gas Electron Multiplier (GEM). The last is particularly interesting since it allows to add amplification stages and reach high gains in safe operating conditions. Light and flexible the GEM device can fulfill many different detector requirements; operation in a wide range of conditions and gas pressures has been already demonstrated. Whilst still experimental, these detectors have very promising performances and increased reliability in harsh operating conditions. Applications in fields other than HEP of these simpler and rugged devices can be anticipated. The number of still open and often controversial subjects of study (as for example the ageing issue), and the continuing imaginative efforts of the experimenters seem to ensure more surprises in the field of gas detectors, and a continuation of the WCC Conference for many years to come.