Modern gas-avalanche radiation detectors: from innovations to applications

Abstract:
Micro-Pattern Gaseous Detectors (MPGD) technologies allow for the conception of advanced large-area radiation detectors with unprecedented spatial resolutions and sensitivities, capable of operating under very high radiation flux. After more than two decades of extensive R&D carried by large number of groups worldwide, these detector technologies have reached high level of maturity. Nowadays, they are adapted as leading instruments for a growing number of applications in particle physics and in many other fields on basic and applied research. The growing interest in MPGD technologies and their mass-production capabilities naturally motivates further developments in the field.
I will introduce the state-of-the-art detector concepts and technologies and will review their evolution, properties and current leading applications. Future potential applications as well as new technology challenges will be discussed.