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Type: **Review/Tutorial**

## **The Electronics Systems for cryogenic detectors in particle Physics**

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Researches that use bolometric, scintillating or semiconductor high impedance detectors, such as those experiments devoted to the study of dark matter and the neutrino mass, as well as astrophysics, demand ultra-low noise amplifiers. The signal to noise ratio increases by minimizing both the heat injection and the input stray capacitance, which leads to locate the front-end electronics at cryogenic temperatures, as near as possible to the detector. Other sensors, such as the TES and MKID coupled with RF-SQUID, allow multiple channels multiplexing in order to reduce the number of wires and share expensive resources. These techniques need high bandwidth amplifiers operating at deep cryogenic and up to radio-frequencies. The state of the art of such technologies and circuit topologies will be given.

### **Less than 5 years of experience since completion of Ph.D**

N

### **Student (Ph.D., M.Sc. or B.Sc.)**

N

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