

---

**COLLOQUIUM INAUGURALE  
DEL DOTTORATO IN FISICA, A.A. 2021/2022  
LEZIONE VOLTIANA**

---

Dipartimento di Fisica, Aula102  
**Giovedì 28 Ottobre 2021 ore 16:30**

***High precision cosmic ray physics with AMS-02  
on the International Space Station***

**Roberto Battiston**  
*Università di Trento*

---

The Alpha Magnetic Spectrometer (AMS-02) is a state of the art cosmic ray magnetic detector operating on the International Space Station (ISS) since May 2011, performing a continuous, direct measurement of cosmic ray flux and composition in the rigidity range,  $O(1\text{GeV})$ - $O(1\text{TeV})$ .

The large statistics collected during 9 years of operation, more than  $1.5 \cdot 10^{11}$  particles, allow for the precise study of the spectra of all cosmic ray species (p, He, Li, B, B, C, N, O and  $e^-$ ), and begins the exploration of the rare antimatter components ( $p_{\text{bar}}$ ,  $e^+$ , D,  $^3\text{He}$ ,  $^4\text{He}$ , etc.), which can be used as probes to search for new physics phenomena.

We review the results obtained from the data collected so far, the perspectives of the ongoing analyses and of the forthcoming 10 years of data taking on the ISS.