

AMS ROMA-1 ACTIVITIES 2021-2022

CDS “PREVENTIVI”

ROME JULY 2021



AMS Roma-I group activities in 2021/22

- Support of AMS operations at POCC
- Research in Space Radiation (GCRs,...)
- Research in Space Radiobiology in collaboration with IRCCS University Hospital of Bologna (IRCCS-UHB)




AMS Roma-I People 2021/22

Alessandro Bartoloni – INFN (0.9 FTE)
 Bruno Borgia – INFN & Sapienza (-)
 Aboma Negasa Guracho – AdR INFN Roma (1) – Starts in July 2021
 Giuseppe Della Gala – IRCCS UHB (0.3)
 Giulia Paolani - IRCCS UHB (0.3)
 Miriam Santoro – IRCCS UHB (0.3)
 Lidia Strigari – IRCCS UHB (1)
 Silvia Strolin – IRCCS UHB(0.3)
 Vincenzo Valente – GARR Associate & INFN (-)

*One AdR selection on going (1)

FTE e Richieste (Keuro) per il 2022

FTE e Richieste (Keuro) per il 2022				
Persone			FTE	
9			4.1+1*	
Missioni	Consumi	Servizi	Inventariabile	Totale
23	4	1	3	31



PUBBLICATO IL
20 Maggio 2021

Dall'esterno della Stazione Spaziale Internazionale (ISS) AMS-02 cerca segnali di anti-materia primordiale **NEWS**

AMS Flight Systems

The diagram illustrates the AMS Flight Systems architecture, showing the flow of data and control signals between the International Space Station (ISS) and the ground.

Top Section: ISS and Satellite

- AMS**: The Alpha Magnetic Spectrometer is shown on the ISS.
- AMS Laptop**: A laptop used by the astronaut for system monitoring and control.
- ISS Astronaut**: The astronaut is shown operating the AMS.
- Tracking and Data Relay Satellite**: A satellite in orbit that relays data from the ISS to the ground.

Bottom Section: Data Processing and Control

- AMS Detector Components**: TRD, TOF, Tracker, Magnet, TOF, RICH, and ECAL.
- 228,542 Signals (7 Gbit/s)**: Data from the detector components is sent to the **Data Reduction Computers**.
- 1118 Temp. Sensors, 298 Heaters, Power Distribution, TRD Gas System, Tracker Cooling System**: These systems are monitored and controlled by the **Monitor/Control Computers**.
- Data Flow**: Data from the **Data Reduction Computers** is sent to the **Readout Computers** (x560), then to the **DAQ Computers** (x64), and finally to the **Main Data Computers** (x16).
- Control Flow**: The **Monitor/Control Computers** send control signals to the **AMS Laptop** and the **ISS Avionics** via **2 x Controller Area Network (CAN) buses (1 Mbit/s)**.
- ISS Avionics**: The avionics system on the ISS, which manages the overall flight and data transmission.
- Ground Station**: The **AMS Laptop** and **ISS Avionics** are connected to the ground via **Ku-band** and **S-band** antennas.

Legend:

- Ku-band High Rate (down)**: Events <10Mbit/s> Monitoring: 30 Kbit/s
- S-band**: 1 Kbit/s (up) 10 bytes/s (down)

(Image by X. Cai – AMS Collaboration)

(Image by X. Cai – AMS Collaboration)

19 maggio 2021 | 13.43
LETTURA: 5 minuti



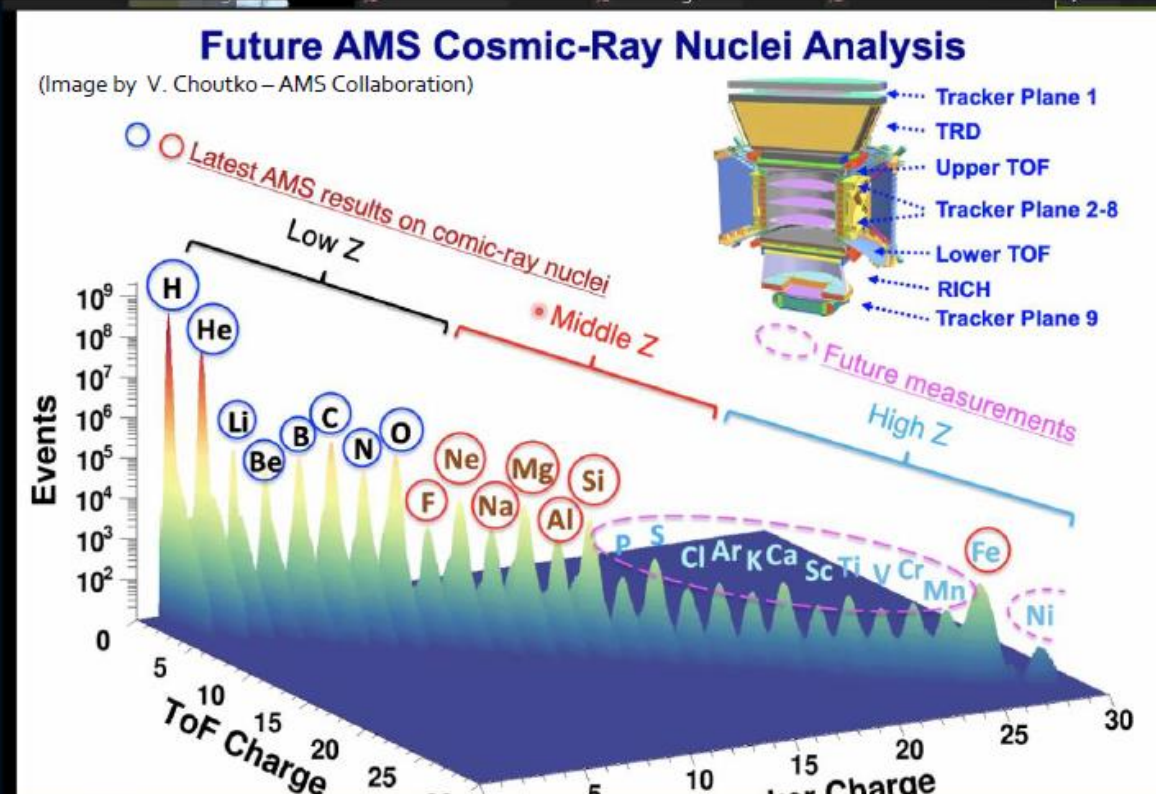
Al lavoro sulla Stazione Spaziale Internazionale dal 2011, il rivelatore di particelle cosmiche ne ha analizzate già 170 miliardi

AMS PRL published HEP spires statistics (06/2020 vs 06/2021)

Citation summary results	2020	2021
Total number of papers analyzed:	17	20
Total number of citations:	4064	4942
Average citations per paper:	239	248
Breakdown of papers by citations		
Renowned papers (500+)	3	4 (3%)
Famous papers (250-499)	4	4 (2%)
Very well-known papers (100-249)	1	3 (0.3%)
Well-known papers (50-99)	3	4
Known papers (10-49)	4	3
Less known papers (1-9)	2	2
Unknown papers (0)	0	0

in parenthesis the
AMS papers / INFN RM papers*100 ratio
Period is 2012-2021

AMS is the only magnetic spectrometer in space.
The results from AMS are unlocking the secrets of the cosmos.
AMS will continue to take data for the ISS life time.



Properties of Iron Primary Cosmic Rays: Results from the Alpha Magnetic Spectrometer

AMS Collaboration • M. Aguilar (Madrid, CIEMAT) et al. (Jan 29, 2021)

Published in: *Phys.Rev.Lett.* 126 (2021) 4, 041104

Properties of Heavy Secondary Fluorine Cosmic Rays: Results from the Alpha Magnetic Spectrometer

AMS Collaboration • M. Aguilar (Madrid, CIEMAT) et al. (Feb 25, 2021)

Published in: *Phys.Rev.Lett.* 126 (2021) 8, 081102

AMS/SPRB-2020/2021



ESA EUROPEAN LARGE LOGISTIC LANDER - EL3
EXPLORING THE MOON FROM A LARGE EUROPEAN LANDER

CALL FOR IDEAS
29 MAY - 3 JULY 2020

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Improving the Biological Risk Assessment of Exposure to Ionizing Radiation in the Exploratory Space Missions
www.space4womenshow.com
Saturday, April 17, 2021
3:00 - 4:00 PM CET (Berlin)



2020 INFN Roma research activities on SPRB

- Poster on the topics presented at IEEE-NSS MIC 2020 Conference
- Participation to «ESA call for ideas for a European Lunar Lander»
 - The proposal was selected for two different Payload (on going)
 - Participation to the preparatory meetings
 - Inclusion in the ESA Topical Teams on the subject

2021

- One new person (AdR) in the group since July 2021 and a new one expected in the next months
- RAD9 (accepted oral talk – conference in June not possible to be in presence)
- GLEX 2021 (accepted oral talk (in presence...) – proceedings papers in publication)
- Review on «space radiobiology models» submitted
 - [Medical Application and Radiobiology Research of Particle Radiation](#) Frontiers journal
- Outreach activities
 - Organization and participation at the Space4Women initiative sponsored by the ONU-UNOOSA
 - Participation at “Uno Spritz di Antimateria” to celebrate the AMS 10 years in space (INFN)
- EPS-HEP 2021 oral-talk on the topics in July
- INFN course on SPRB in preparation for September/October 2021
- IAC-2021 conference oral talk (October 2021)
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