

Nadia Pastrone

Statement for the IMCC CB chair election

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My main field of interest and activities is experimental high-energy physics using accelerators.

I worked in several international collaborations, focused on: design, assembly, and operation of different kind of detectors in complex experimental environment, also on accelerator tuning; data analysis; coordination of international teams of physicists, engineers and technicians; managerial responsibilities of local, national and international groups.

I have been strongly promoting R&D activities on Future Accelerators, notably the studies for a Muon Collider facility within the INFN Scientific Committee I chaired since 2015 and at CERN to create a project to reassemble the community.

I was appointed by LDG to chair the working group, which submitted the input document to the European Strategy update by end of 2018 ([arXiv:1901.06150](https://arxiv.org/abs/1901.06150)).

Afterwards I kept leading that “extended” working group to promote the international effort on Muon Collider studies and organize the community workshops at CERN and other activities (i.e. April APS meeting 2020), till we obtained the ESPPU recommendation in June 2020. The international collaboration was soon launched by LDG July 2020 and CERN Mid Term Plan included Muon Collider funding starting in 2021, while the U.S. Snowmass21 strategy process was progressing. Under the leadership of Daniel Schulte, we maintained the strong collaboration with Mark Palmer and the U.S. community. A Snowmass Muon Collider Forum was actively working in parallel and in synergy to the Muon Panel established to prepare the LDG Accelerator R&D Roadmap.

I took part to the Roadmap panel work and I was engaged in the SnowMass multi-TeV colliders group. We strengthen the international collaboration, which is the core of the growing international community who submitted five contributed papers to the Snowmass proceedings, now becoming an EPJC paper.

Meanwhile we discussed and applied to the European HORIZON-INFRA-2022-DEV-01-01 call, submitting a project on the Design Study, strongly supported by TIARA. MuCol was approved at end of July 2022. At the same time the possibility to design a multi-TeV Muon Collider facility got an enthusiastic support at the Snowmass Seattle Community meeting.

I always took a relevant part in strengthening the community, in particular recently to bring new INFN resources engaging on accelerator technologies in the EU project, and also contacting new important laboratories.

The EU project approval is a crucial recognition and a step forward for the international collaboration and it is now a driving force to work together, but also to stimulate new collaborators and steer the effort on the project.

I am presently organizing the resources task force, together with the management and the coordination team.

First of all I really care that our International Muon Collider Collaboration could progress and become a running facility.

Becoming the chair of the IMCC collaboration board is both a challenge and a great honor if I were elected.

At present we are in a transitory phase, where the original core team of institutes signed the Memorandum of Cooperation – drafted originally in 2020 –, others are considering or in the process to sign, while we have still to wait the P5 strategy process to be closed to confirm the big support we had from the MAP community and the new groups in U.S.

As in the past five years I intend to devote great effort to the benefit of the collaboration, both to consolidate the present groups and activities and to promote the search for new resources within the present institutes or seeking for new ones.

We need to make sure that all the interested institutes could find their adequate roles and their activities could be recognized. Everybody should take part to reach the common goal to prepare a design study to demonstrate by the next ESPPU that a multi-TeV Muon Collider facility is scientifically justified and worth the investment into a full CDR and we can bring together enough resources to go ahead with a demonstrator.

Within the implementation of the Accelerator R&D Roadmap a government structure has been designed to maximize cooperation and include representation from all stakeholders and international partners.

The ICB chair has an important role in building a strong collaboration and supporting the management in this process.

The MoC does not imply any commitment on resources, but it established the involvement of the participants to support and prepare the Muon Collider Design Study at the high-energy frontier, initially hosted by CERN. Moreover now we count on MTP resources, to be incremented if possible and on the MuCol resources both from the EC and the matching contributions by beneficiaries and associated institutes. I am sure we can consider this a promising starting point to collect more consensus and support at the international level.

We need IMCC to be recognized in the CERN Grey Book, also to easily grant access to CERN at all the active collaborators.

The ICB should establish a first light constitution, where basic rules for representation and decision should be discussed and agreed. A few necessary committees, already partly in place, could be recognized and established such an editorial and publication committee.

The ICB should be proactive to work with the project management and each different institutes and Funding Agencies.

I will be always ready to discuss with anybody who has any suggestion or criticism for the best of the collaboration.

From the curriculum vitae of Nadia Pastrone:

1989 Ph.D. in Particle Physics, University of Torino (Italy) – guest scientist, Fermilab (USA) in 1987-1988

2009-now research director, INFN, Torino (Italy), permanent position since 1988

Main Recent Responsibilities in Scientific Coordination and Evaluation Panels

2023 INFN scientific contact for the EU project MuCol: Muon Collider Design Study – approved July 2022

2021-now task leader of MUon Strategy Network for the EU H2020 project I.FAST: accelerator R&D

2021-now INFN scientific contact for the EU H2020 project AIDAInnova: detector R&D

2020-now core team member for the new forming Muon Collider international collaboration at CERN

2017-2020 chair of CERN Muon Collider WG: input document to the ESPPU and main community workshop

2015-2019 chair elected of INFN CSN1 (HEP with accelerators) committee: 20 MeV/year and ~ 1400 people
new activity on Future Accelerators R&D and 56 MeV budget secured for ATLAS and CMS phase2 upgrades

2012-2014 INFN elected team leader in CMS experiment at CERN-LHC (300 people - 12% CMS)

Major Collaborations

2017-now Muon Collider activities and new international collaboration at CERN – including Snowmass21

2003-now CMS at CERN-LHC: construction and operation of ECAL - leading role for INFN in MB, FB and CB and in Italy

2009-2014 neu_ART: an innovative digital radiography and tomography apparatus for large artefacts built in Torino

1985-2006 E760 - E835 at FNAL: charmonium spectroscopy in antiproton-proton annihilations – main responsibilities

Bibliography (inspire): over 1200 publications in peer-reviewed journals, h-index: 127

2022-now Torino Academy of Sciences member for the Sciences Class, corresponding since 2015 – Ravani-Pellati prize