Dario Barberis

Researcher

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Education and training

1982
PhD in Physics
Photoproduction of Charmed F Mesons at the Omega Spectrometer
University of Manchester - Manchester - GB

1980
Laurea in Physics
Preliminary study for an experiemnt on nucleon stability - 110/110 e lode
University of Milan - Milan - IT

Academic experience

1992 - ONGOING
University researcher
University of Genoa - Genoa - IT
Experiments Omega and ATLAS at CERN

1991 - 1992
Foreign visitor
Nuclear Science Institute (ISN) - Grenoble - FR
Experiment Omega at CERN

1988 - 1991
Research associate
University of Heidelberg - Heidelberg - DE
Experiment Omega at CERN

1985 - 1988
CERN Fellow
CERN - Geneva - CH
Experiment Omega at CERN

1982 - 1985
Research associate
University of Manchester - Manchester - GB
Experiment Omega at CERN

Language skills

Italian
Mother tongue

English
Proficient

French
Proficient

German
Basic

Russian
Basic

Research interests

Scientific activity in the ATLAS experiment:
Since 1996: ATLAS experiment for the study of proton-proton interactions at very high energy:

- definition of the geometry of the internal detector and in particular of the pixel tracer;
  simulation of events for the study of the performance of ATLAS in the identification of the origin of the jets ('b-tagging');
- editorial responsibility for the 'B-tagging Performance' chapter of the ATLAS Physics Technical Design Report (1999);
- organization of the development of the new software of ATLAS using modern technologies (C ++);
- definition and first implementation of the procedures for the quality control of the software of ATLAS;
- as representative of ATLAS in the CERN evaluation committee software committee on the needs of the calculation of experiments at the LHC accelerator (CERN-LHC Computing Review), study of the distribution of human and financial resources of CERN and of experiments in the coming years, evaluating the needs of the experiments and the evolution of the market of IT products.

From March 2003 to February 2010 I was the Calculation Coordinator ('Computing Coordinator') of the ATLAS experiment. As such, I have:

- defined the calculation model of the experiment and the necessary resources;
  organized the software development work of the experiment and the computing infrastructure (more than 200 people worldwide);
- participated in the management of the ATLAS experiment as a member of the Executive Board;
- participated in the direction of the WLCG Collaboration (Worldwide LHC Computing Grid) which brings together all the computing centers that support the experiments at LHC;
  defined the architecture of the interfaces between the experiment software and the middleware produced by the Grid projects and used by ATLAS;
- periodically defined the need for computing capacity, in terms of CPU and data storage, for ATLAS in the various computing centers for the years to come and reported their current and past usage.

From March 2010 to September 2017 I was the coordinator of the databases

of ATLAS and coordinator of the working group on the Tier-3 in Italy. This double task involved:

- optimization of data access in databases (geometry, alignments, calibrations), for data analysis jobs;
- software development to quickly access selected individual events and extract them from the large mass of events recorded by ATLAS using an event index (TAG) in an Oracle database;
- design of the new storage service architecture and access to calibration and alignment data to be implemented for the LHC Run3;
- definition of the final analysis model in the local computing centers (Tier-3) and integration with the calculation model of ATLAS;
- testing of hardware and software configurations to optimize the use of local computing resources for the analysis of ATLAS data.

Since December 2011 I have also been responsible for the protection of information and access to data from the ATLAS experiment.
At the end of 2011 I proposed a project to catalog all the events produced by ATLAS (EventIndex) and now I direct the development, based on NoSQL technologies (Hadoop / HBase). The project, started at the end of 2012, was partially funded on PRIN 2010-2011 funds.
From June 2014 for three years I was a member of the Computing Speakers Committee of ATLAS.
Since October 2017, I am coordinator of the monitoring systems of the distributed computing system, used to continuously monitor and optimize the use of collaboration calculation resources. I also work on the development of new tools based on BigData technologies for Run3 by LHC (from 2021 onwards), with the progressive replacement of all Oracle-based tools with more agile and modern systems and the introduction of 'Analytics' systems for experts and for users of calculation systems.
In the ATLAS experiment I continued to deal with the measures of the production properties and decay of heavy quarks (charm and beauty), both within the analysis group of Genoa and as a member, or more often president, of the editorial committees of several publications .
Since 2015, I have been researching supersymmetric particles with R-parity violations that could be produced in proton-proton collisions at LHC and measured by the ATLAS experiment. This research is mainly conducted by the ATLAS-Genova group with contributions from other collaborators.