Prof. Dr. Kerstin Borras

- Head of the CMS Engagement Office -
- Former CMS Deputy Spokesperson -

Affiliation

RWTH Aachen University / DESY in a joint professorship
Email: Kerstin.Borras@desy.de
http://www.desy.de/about_desy/leading_scientists/kerstin_borras/index_eng.html

Professional Experience

Since 2015	Joint Professorship at RWTH Aachen University / DESY (CMS Experiment)
2014-2015	CERN Scientific Associate (CMS Experiment, Deputy Spokesperson)
Since 1999	Senior Scientist at DESY (ZEUS Experiment, CMS Experiment)
1999	Fellow of the Lise-Meitner-Habilitation Program, University of Dortmund (H1 Experiment)
1997-1998	Fellow of the Max Kade Foundation, Rockefeller University New York (CDF Experiment)
1992-1996	Scientific Assistant, University of Dortmund (H1 Experiment)
1988-1992	PhD / University of Dortmund (H1 Experiment)

Selected Committees and Reviews

Since 2013	Think Tank of the Helmholtz Association (German Funding Agency)
Since 2012	German Committee for Elementary Particle Physics (KET)
Since 2012	Plenary European Committee for Future Accelerators (P-ECFA)
Since 2011	Advisory Committee on TRIUMF (ACOT) (National Lab in Canada)
2002-2005	LHC Committee at CERN (chief referee for LHCb and TOTEM)

Research Activities / Convenerships

Detectors:	Design, construction, operation, upgrades, specific physics data analyses
Physics:	Searches for Dark Matter, Forward Physics, Calorimetry
1994-2012	Calorimeter Project Manager in H1 and ZEUS, and for CASTOR in CMS
2002-2005	FSQ PAG Convener in ZEUS for two terms

Selected Contributions to CMS:

2016-2018	Head of the CMS Engagement Office
2014-2016	Deputy Spokesperson
2008-2013	Head of the DESY CMS Group Developing and guiding all activities of the DESY group and encouraging colleagues to assume leading roles in CMS (starting with 38 members and growing to more than 100 members)
2012-2013	Conference Committee Chair (Deputy Chair 2010-2011) → knowledge of many CMS members and known by many of them
Since 2008	Collaboration and Finance Boards (CBI for DESY, ex-officio)

Chair and Member of several ARCs for Forward Physics publications
Contributing to the upgrade of HCAL with SiPMs and µ-TCA
Synergy with Muon & HCAL: initiating HCAL Outer YB0 upgrade with SiPMs
→ implementation in L1 Trigger in progress→ upgrade to µTCA upgrade in preparation

Honors / Awards / Third Party Funds

1985-1987	Fellow of the Foundation of the German Nation
1997	Fellow of the Max Kade Foundation, New York
1999	Fellow of the Lise-Meitner-Habilitation Program
2007-2010	Helmholtz-Russia-Joint-Research Group: 500k €, PI (DESY), MSU, MEPHI, ITEP, LHC, ILC
2008-2013	Initiating and leading three Young Investigator Groups to approval: SUSY, Higgs, Forward Physics
2009-2012	"Landesexcellenzcluster" University of Hamburg, 100k €, PI, SiPMs for HO, link to Muons
2015-2020	Helmholtz Professorship: 750k €, Dark Matter Searches, detector investment: HO-L1 Trigger

Lectures

Since 2007	Lectures and block courses at RWTH Aachen University, Hamburg University, Dortmund University Physics at future colliders, Detectors for particle physics, Diffraction, Time- and Self-Management

PhD (1988 – 1992)

My PhD work occurred at the exciting time of designing, constructing, installing and commissioning the brand-new detectors for HERA. My home institute produced one electromagnetic ring in the forward barrel region (FB2E) and the last ring in the backward barrel region (BBE) for the H1 Experiment. My Diploma thesis laid the basis for the design of the FB2E, and in my PhD work I received immediately crucial responsibilities for the production, quality assurance, test beam campaigns at CERN, the installation and commissioning of the two rings, especially for the BBE, which was soon affectionately referred to as the "Borras Baby". The in-depth calibration of BBE including general studies for electromagnetic and hadronic showers was the main ingredients of my written thesis, which became the basis of a publication, of which I was the primary author, on the overall calibration of the H1 LAr Calorimeter.

Postdoc (1992 – 1996, University of Dortmund, delegated to DESY)

Already as a fresh Postdoc, I became the leader of the Dortmund University group at DESY in the H1 Experiment. I was one of the first Run Coordinators of H1 and, in 1994, I became Project Manager for all calorimeters in the H1 Experiment. The data taking of that year was crucial and yielded data of excellent quality that was used in numerous novel measurements that could be published. While in partial parental leave, I analyzed the then just discovered "rapidity gap events" at HERA and I published the hadron production in diffractive e-p collisions. During those thrilling times many models were developed to try to explain these data, however, it was the definition of the diffractive structure function that was the breakthrough.

Postdoc (1997 – 1998, Rockefeller University, New York)

My idea to combine the study of diffraction in hadron interactions at the Tevatron with measurements at HERA was enthusiastically welcomed, leading to a fellowship from the Max Kade Foundation. Together with the group at the Rockefeller University, we analyzed the data of Run C recorded by the CDF Experiment. The Monte Carlo program developed by me to simulate Double Pomeron Exchange laid the basis for its first unambiguous observation. Employing my experience from HERA we established the breaking of factorization in diffraction, a topic which kept theorists and experimentalists busy for decades.

Scientist at DESY (ZEUS, since 1999)

After returning to Germany from the U.S., I joined the DESY ZEUS group as a member of the permanent scientific staff in a position specifically created to ensure the commissioning, operation and maintenance of the Hadron Electron Separator. This upgrade project was a shower-max detector with $20m^2$ of 20,000 Si pads. Owing to water leaks in the cooling system, the complete detector had to be removed, repaired, re-installed and re-commissioned. Performing all of this was a major logistical undertaking for the small team, which worked tirelessly during all short breaks and planned shut-down phases in order to complete the work. I succeeded in implementing the reconstruction of the data from this upgraded detector into the default ZEUS reconstruction program, considerably improving the identification of electrons.
In addition to this responsibility, I was a co-convener (for two terms) charged with coordinating all activities in the FSQ PAG in ZEUS. I initiated many novel analyses and guided them to publication.

Scientist at DESY (CMS, since 2005)

After working as a member of a special committee evaluating the contributions of DESY to the LHC experiments, I could join my favorite experiment, which I knew already in-depth from my reviews in the LHCC, namely, CMS. Together with Russian colleagues from MSU, MEPHI and ITEP, I obtained new funding for crucial contributions to the CASTOR calorimeter, R&D work for SiPMs within CALICE, and laying the groundwork for intense collaboration on the HCAL upgrade and the HGCal. As co-project leader of the CASTOR calorimeter, I pursued all aspects of the project from its approval up to the first physics publication.
In parallel, in my role as head of the CMS group at DESY, I expanded the group and guided it to take up leading roles in CMS. In addition to these duties, I served as deputy and then as chair of the CMS Conference Committee. In this role I modified the Constitution to ensure a fair and transparent selection of speakers.

Professor at RWTH Aachen University and Leading Scientist at DESY (CMS, since 2015)

Realizing that the trigger link from HO to the RPC muon trigger was never taken into operation and that the upgrade of HO with SiPMs would provide a good basis for this, I initiated a common effort to establish this link in a collaboration with colleagues from Aachen. This fruitful collaboration of the past and present led to the successful application for a joint professorship funded for five years by the Helmholtz Association. Now my group is establishing the HO trigger-link and is searching for dark matter with machine learning methods.

CMS Deputy Spokesperson (2014 - 2016)

During my time as CMS Deputy Spokesperson, which is part of the executive management of CMS, I was concerned with daily operations, with major obstacles like the problems in the magnet cooling, failures in the barrel pixel, as well as organizing LHCC reviews, VIP visits and last, but not least, the re-organization of the EPR system with the help of a dedicated review committee. This effort yielded a significant reduction in the EPR load, which was a major milestone. It was also the exciting time of the preparation of the Technical Proposal (TP) for the Phase II Upgrades, in which major decisions, for example, for the new Endcap Calorimeter were taken. The new layout of the CMS Management Board organigram was one of my early management ideas and with its re-organization of reporting lines it has proven to work for several years with only minor adjustments.

Head of the CMS Engagement Office (2016 - 2018)

During my term as CMS Deputy Spokesperson, I realized that several areas need improvement and dedicated managerial work. Together with the elected Spokesperson, I created the Engagement Office to address these areas and to pursue energetically its mandate. With the team of the Engagement Office, I streamlined the membership process for new institutes and fostered a more welcoming entry to CMS as well as providing our new colleagues with prompt assistance. This has paid off in that more institutes have joined and more are in the pipeline. My colleagues and I have also helped institute leaders to find tasks that match the expertise and interests of their personnel and optimize their EPR in order to streamline the process of obtaining authorship for their new members. Employing a dedicated discussion group for recommendations, the upgrades are now phasing into the EPR system in a way that is sustainable.
Dedicated discussions were held with the project managers and coordinators in order to document their present and the future challenges. The main findings are presented in the White paper: CMS 2035 - Towards a Sustainable Collaboration (https://cms-docdb.cern.ch/cgi-bin/DocDB/ShowDocument?docid=13459). Where possible, immediate measures were taken and mitigations for future challenges initiated.

Excellent Soft Skills

Personal style: very diplomatic, always searching for win-win outcomes in conflict situations, efficient, democratic management style, belief in delegation, very supportive of young people.
Astute in identifying and employing synergies. An excellent team player, especially with other institutions. Broad knowledge of research environments in different countries. Maintaining good relations at all levels in CMS, CERN, DESY, Helmholtz and other countries. Highly visible: representing CMS, CERN, RWTH Aachen University, DESY and particle physics in meetings with funding agencies, VIP visits and public media.