

Vision and Evolution Towards a Sustainable Collaboration - Kerstin Borras

For more than 25 years our Collaboration has been extraordinarily successful: in the construction of the detector; in the development of sophisticated software and computing, and in the efficient collection and analysis of data, crowned by the historic discovery of the Higgs boson. First upgrades have been installed during Long Shutdown 1 (LS1), resulting in excellent data taking in Run 2 leading to the publication of a wide range of first-rate physics results. We were able to cope with all the challenges we faced because of the extraordinary talent and ingenuity within the Collaboration. One of my goals is to lay the groundwork that will ensure that more of this talent can be nurtured and sustained for the long-term.

Opportunities and Challenges during 2018-2020

Guiding the Collaboration through Long Shutdown 2 (LS2) will be a large part of the mandate of the next Spokesperson and requires a set of objectives and priorities that differ from those of the recent past. The Collaboration will be confronted with challenging tasks providing many opportunities for colleagues to get engaged in exciting topics in hardware, software, and data analysis. The mandate of the Spokesperson includes removing obstacles that deter colleagues from getting involved and building the foundations for a Collaboration that can be sustained through the end of the LHC era. The main challenge facing us is the need to adapt the CMS organization that has been so successful to date, to address the increasing demand for the upgrades, concurrent with a dynamic flow of resources between running activities, and constrained by what is likely to remain a constant level of people-power.

LS2 presents a unique chance to re-evaluate and re-optimize how CMS is organized, opening new opportunities to prepare our Collaboration for a sustainable future with improved procedures, novel approaches and training new experts to enhance our productivity with reduced people-power while maintaining a full program of physics analyses. Should I be elected Spokesperson, I will seize the opportunity to prepare our Collaboration for a sustainable future.

It is of the utmost importance for the continued success of the Collaboration that proposed changes move forward only after wide consultation throughout the Collaboration. This requires a management team that is adaptable, open, diverse, and is at the service of the Collaboration. A team with these characteristics will lead to enhanced participation of the Collaboration in decision-making at all levels and increased transparency and delegation of responsibility.

In the following I focus on what will be my main goals as Spokesperson, goals guided by these principles: wide consultation for strategic planning and transparent decision making, diversity as our strength, career development being important for our colleagues and the sustainability of our Collaboration. With my in-depth knowledge of all aspects of the Collaboration I see an urgent need to address the challenges in this way and I invite you to discuss these plans with me in person to complete them.

Main challenges in LS2 and some envisaged measures to meet them: finishing ongoing analyses of Run 2 data will free people for other vital opportunities in physics analysis as well as preparing for Run 3, HL LHC and beyond with dedicated initiatives. Finishing the Phase I Upgrades on time will use the lessons learned from previous upgrades. Establishing excellent performance of the detectors for Run 3 will be addressed with modifications in hardware and/or novel reconstruction and analysis methods. Preparing for the next data taking well and raising the efficiency of operations with reduced people-power are vital to the continued success of CMS, as is training of new experts. Enabling our Phase II Upgrades with strong support such that we can meet our project milestones and ambitious goals is crucial for our future success.

Main challenges for Phase II Upgrades and some envisaged measures to meet them: We must ensure equitable sharing of responsibilities and sufficient funding for an ambitious upgrade program that will maximize the rich physics potential of HL LHC. Visits to the various officials of the Funding Agencies, Universities and Institutes will be very important. The necessity of providing appropriate funding for operations and technical skilled experts must be emphasized. To lay the basis for efficient operation in the new era of the HL LHC we must take advantage of synergies wherever appropriate, fostering common electronics, common system designs, and sharing of experts. Strengthening Technical Coordination and Electronics Coordination will empower the teams to guide developments towards common solutions.

Continuing to optimize the structure of our physics framework will reduce the needed resources: avoiding duplication of analyses with similar final states, employing modern approaches to refresh our tools, enabling sufficient support for common objects, as examples, will allow for more effectiveness in physics analysis.

Establishing Groups to strategically prepare for physics, detectors, software and dedicated taskforces will be one focal point of the mandate. It will enable us to take advantage of the broad and deep competencies available across the whole Collaboration, including faculty who can afford only a part-time commitment, and enabling early career paths for skilled colleagues. The envisaged groups are for example:

- **Taskforce Efficiency:** Analyze current operations, formulate a technical plan to raise efficiency, and work with Collaboration experts on implementation. The goal is to optimize and reduce the people-power needed for operation and analysis, which is vital to the continued success of CMS.
- **Preparatory Group Detector in Run 3:** Assess and analyze the expected performance evolution of the detector components with the goal to develop sustainable long-term strategies for maintaining excellent performance.
- **Preparatory Group Physics in Run 3:** Assess strategically what is needed to understand the data in Run 3 in terms of physics and in terms of tools and approaches, and how state-of-the-art machine learning can be leveraged with the goal to make sure that all ingredients are prepared well ahead.
- **Preparatory Group Physics in HL LHC and beyond:** in close cooperation with the upgrade physics study group and the work for the HL LHC / HE LHC Workshop that will conclude by the end of 2018 for the EU strategy. Plans will be developed for a CMS Physics TDR.

It is important to note that these groups be established to work closely with the present coordination areas, supporting them and bringing additional expertise to bear.

Strengthening the Collaboration with wide consultations for strategic planning and transparent decisions

Awarding leading roles, responsibilities, and reviewer positions in a fair and inclusive way across the Collaboration will enhance the visibility and involvement of all regions. We must balance the imperative of maintaining continuity while phasing in new colleagues. The fair distribution of the load in work and cost is mandatory. The needs for core tasks, including upgrades, will be kept as low as possible. The next steps can involve: an assessment of M&O B costs and distribution and a phasing-in of institutional and regional responsibilities. Remote contributions are essential and we will tailor procedures to facilitate them.

Attracting and welcoming new institutes is crucial to keep pace with the increasing demands of our ambitious program. The strong progress accomplished by the Engagement Office has to be continued. To foster internal cooperation we plan to arrange “small country/institute”-fairs for the exchange of ideas and clustering.

We intend to reinvigorate the Weekly General Meeting with presentations of interesting topics, enabling discussions, and offering presentations to colleagues working in the background on topics other than analysis.

Concerning the management, we will continue to strive for open two-way communication with the Collaboration, involving special roles for the group of Advisors, which will include the Young Scientist Committee Chair, as well as the Regional Representatives.

Growing careers is a very important measure to give attractive prospects to individuals on the one hand and on the other ensure sustainability for the Collaboration. Early assignment of responsibility for talented young physicists and individual mentoring at all career levels as well as opportunities to shine will be pursued. A change of culture will be addressed by several measures: skilled technical work needs to receive the appropriate recognition.

Overview of my qualifications to lead CMS

By having fulfilled many responsibilities successfully in various experiments including CMS, I have acquired a diverse set of experiences. They, together with my extraordinary in-depth knowledge of the Collaboration, are enabling me to identify solutions that will ensure the long-term success of CMS. In various important roles, I influenced the development of CMS, streamlining processes after deep consultation to make them fairer and more transparent. For example, the new Engagement Office (EO) was established as a forum to facilitate deeper participation of colleagues with the activities of the Collaboration. Thinking ahead is another prime goal of the EO. Its first important findings, based on intense consultations, are documented in the White paper: *CMS 2035 - Towards a Sustainable Collaboration*. I am well known inside as well as outside the Collaboration and often serve as the “face of CMS”. My approach always is to look for an outcome that is win-win for all parties.

In the role of the Spokesperson I will work with all to develop and implement the goals, such that everybody, remote or local, can participate with their own capabilities and take ownership of the accomplishments. More diversity, consultation, fairness will create deeper involvement and enthusiasm. CMS will remain a fascinating place on the global scale for the next two decades and I am fully committed to devote all my time to serve it.

It is a great honor for me to be a candidate for the CMS Spokesperson election.