Collisions and Collaboration: The Organization of Learning in the ATLAS Experiment at the LHC

Max Boisot, Markus Nordberg, Saiuml;d Yami, Bertrand Nicquevert
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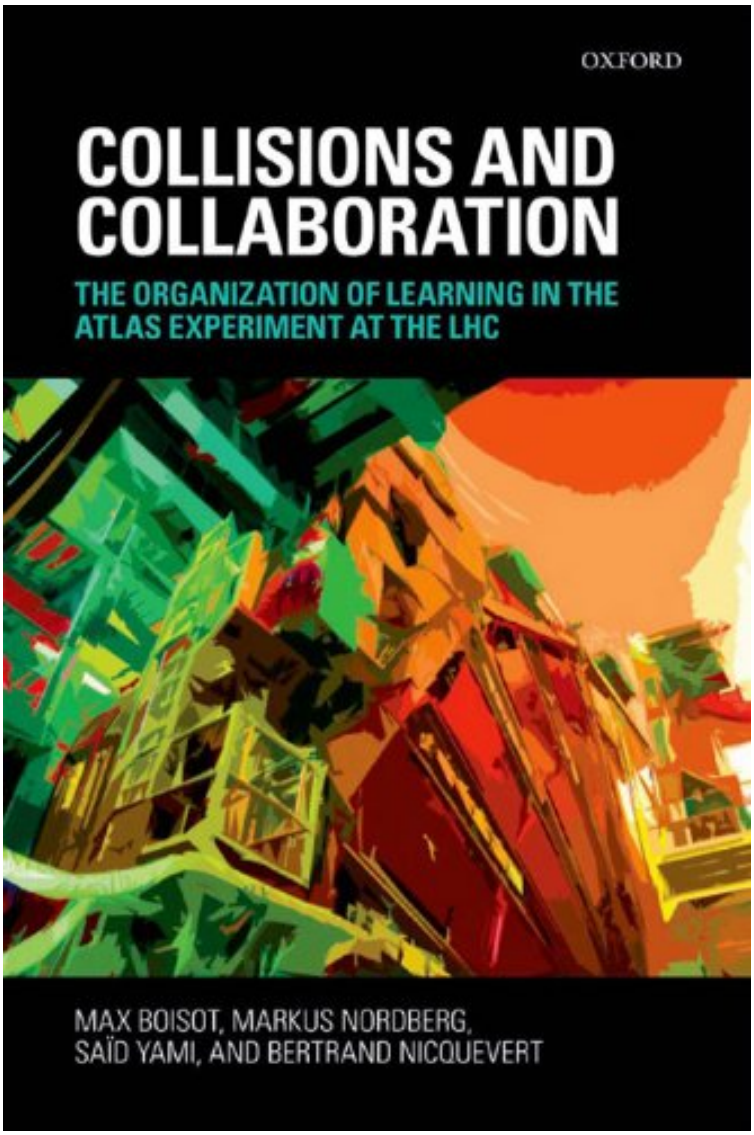

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Max Boisot, Markus Nordberg, Saiuml;d Yami, Bertrand Nicquevert : Collisions and Collaboration: The Organization of Learning in the ATLAS Experiment at the LHC before purchasing it in order to gage whether or not it would be worth my time, and all praised Collisions and Collaboration: The Organization of Learning in the ATLAS Experiment at the LHC:

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reader is invited to explore ...By JerryJonesIf you responsible for leading teams of incredibly talented people or building collaboratives comprised of ambitious rivals with conflicting agendas, this book is a must read. The LHC Collaborative serves as the perfect frame by which the reader is invited to explore how effective teams achieve incredible results despite the fact that these temporary work alliances are often fragile and strained.More than that, you'll see how the process worked in helping achieve the one of greatest scientific discoveries in history.1 of 1 people found the following review helpful. Physics for Ph.D.s -- in managementBy A. J. SutterContrary to first appearances, this book is primarily for readers interested in management studies, or others who believe that an MBA is worthwhile for its content and not merely as a credential.To calibrate this review: Irsquo;m not among those believers, and my interest was more prosaic, being in accelerators per se. I turned to this book because as I write Japan is a candidate for a large international accelerator project; if it wins, the project would be sited not far from where I live. I thought the book might help me prepare for an international conference about the collider being held soon in my hometown, and especially to help me learn more about how such projects are run and the hurdles they face. The book focuses on the ATLAS detector system, one of four experimental systems at the Large Hadron Collider in Switzerland. That system alone entails a collaboration involving around 3,000 scientists in 38 countries.I found some of what I was looking for in the first 10% of the book, with other tidbits scattered throughout the remaining portion. But from Chapter Two onward the facts and anecdotes of interest were embedded in a theory about something the authors call ldquo;I-Space.rdquo; This isnrsquo;t a theory about solipsism, but is something more like a solecism: borrowing the prestige of ldquo;information theoryrdquo; while thoroughly making a hash of it. It's put forward using a befuddled approach all too common in management literature attempting to borrow from science: First the authors first build their science cred, in this case by citing various classic papers written by Zurek, Bennett or Landauer about information theory, i.e. the theory developed by Claude Shannon, whose 1948 paper is also cited. Next they throw in a chestnut or two of false wisdom, e.g. ldquo;In physics, entropy is a measure of disorderrdquo; (@35n8), and the claim that the Zurek, etc. papers ldquo;establish the equivalence between data and energyrdquo; (@30). Then throughout the rest of the book they throughly distort the scientific theory they invoked in the first place. In this case that includes talking about ldquo;informationrdquo; as something that has meaning mdash; not at all the way in which Shannon used the word, as he took some pains to mention his paper cited in the book.This sort of pretentious misch-masch is pretty common and might have been easy to overlook if it had been confined to one chapter. But unfortunately the topic of the book turns out to be the nature of I-Space as illustrated by the ATLAS project, rather than that project in its own right. Therersquo;s plenty of discussion about the collaboration, of course, but itrsquo;s always with reference to what it teaches us about I-Space and and something the authors call ldquo;social learning cyclesrdquo; (SLCs), the sort of reification that will make readers of Harvard Business Review feel right at home. So will the generous helping of 2x2 matrices, such as Perrowrsquo;s typology of suppliers; cites to strategy gurus like Michael Porter and Henry Mintzberg; quantitative explanations of ldquo;strategic option theory;rdquo; and the bestowal of extra profundity onto phrases like ldquo;distributed learning processrdquo; and ldquo;intrinsic project volatilityrdquo; by putting them in italics.Even from a management point of view, much of this is old wine in new bottles. The authors of Chapter 3 describe their ldquo;surpriserdquo; that the ATLAS team members didnrsquo;t have much use for conventional principles of management one of the authors had presented to them in three workshops. Rather, ldquo;creating the right context for highly motivated and competent people and letting them get on with itrdquo; may have better results than top-down specification and control (@75). Nice, but Mintzberg has been making this point for decades now, and this is also familiar from the famous B-school case of Hondarsquo;s US success with lightweight motorcycles during the 1970s. The chapters on procurement, which describe such technology development techniques as running several projects in parallel and seeing which one succeeds first or best, are pretty much what a company like Applied Materials was doing when I joined them 20 years ago. Can't knock the ATLAS team for using such techniques, but the book veers into fiction when it treats these practices as something novel or peculiar to this type of collaboration. Elsewhere wersquo;re given the revelation that ldquo;In effect, the ATLAS detector, the primary focus of the collaborationrsquo;s concerns and efforts, constitutes the physical hub of a vast heterogenous network engaged in globally-distributed data-processing activities and pursuing ambitious scientific objectivesrdquo; (@202). Who knew?If you enjoy reading business books, and especially ones that twine together business and themes from physics, then very possibly yoursquo;ll enjoy this book. Just be aware that itrsquo;s not written in the easy-reading style of the typical business bestseller -- itrsquo;s published by Oxford, after all -- though that might also make it seem all the more important. If yoursquo;ve already read Mintzberg, and especially if you've worked at a technology-intensive manufacturing company, there's not much new you'll get from it aside from the physics ambience. If yoursquo;re mainly interested in particle physics, spend at most an hour or two dipping into the book at your institutionrsquo;s library, and save your money.0 of 0 people found the following review helpful. Advancing into the UnknownBy SamantineThis is a first-class introduction to advanced particle physics and its research for the non-physicist, and a fascinating look inside the organization of the largest multinational research effort of our times. In advanced physics, this is "the only game in town" -- so its outcomes matter enormously to the physicists taking part, and also to the millions of citizens from around the world whose taxes fund it, and whose economies will benefit (eventually) from its

findings. The recent success of the CERN researchers in discovering evidence of the Higgs boson is testimony that the intricate web of trust and information sharing and collaborative learning worked, despite the vast majority of researchers not being CERN employees. The sheer audacity of endeavoring to find evidence required significant advances in detectors and computers particularly, well beyond the capabilities of the time when this project began. Hence not only did researchers have to push their suppliers; they also had to interactively solve problems, where one researcher's preference might unwittingly cause difficulties for others. The book lays out the organizational responses to such uncertainty -- key lessons for businesses with outsourced partners scattered around the globe, mostly not company employees, whose innovative capabilities must be engaged. Well worth the effort to read it!Collisions and Collaboration: The Organization of Learning in the ATLAS Experiment at the LHC

After twenty-five years of preparation, the Large Hadron Collider at CERN, Geneva, is finally running its intensive scientific experiments into high-energy particle physics. These experiments, which have so captured the public's imagination, take the world of physics to a new energy level, the terascale, at which elementary particles are accelerated to one millionth of a percent of the speed of light and made to smash into each other with a combined energy of aroundfourteen trillion electron-volts. What new world opens up at the terascale? No one really knows, but the confident expectation is that radically new phenomena will come into view.The kind of 'big science' being pursued at CERN, however, is becoming ever more uncertain and costly. Do the anticipated benefits justify the efforts and the costs? This book aims to give a broad organizational and strategic understanding of the nature of 'big science' by analyzing one of the major experiments that uses the Large Hadron Collider, the ATLAS Collaboration. It examines such issues as: the flow of 'interlaced' knowledge between specialist teams; the intra- and inter-organizationaldynamics of 'big science'; the new knowledge capital being created for the workings of the experiment by individual researchers, suppliers, and e-science and ICTs; the leadership implications of a collaboration of nearly three thousand members; and the benefits for the wider societal setting.This book aims to examine how, in the face of high levels of uncertainty and risk, ambitious scientific aims can be achieved by complex organizational networks characterized by cultural diversity, informality, and trust - and where 'big science' can head next.

"This is a masterful piece of research that will make an enduring contribution to our knowledge of how the organization of science develops at the frontier of knowledge. Boisot and his many colleagues have crafted an excellent volume that convincingly explains why management theorists may have more to learn about scientific organization from physicists than vice versa."--Henry Chesbrough, University of California, Berkeley, and author of Open Innovation: The New Imperative for Creating and Profiting from Technology (OUP, 2006)"This book has vast implications far beyond CERN, The Large Hadron Collider, and the Atlas project. Based on the concept of 'Information Space', 3000 scientists and others face the irreducible unknown. Standard planning and optimization fail. Emergence and generativity succeed. This book is a prolegomenon for governments and an emergent set of interwoven global civilizations."--Stuart Kauffman, MacArthur Fellow FRSC, Santa Fe Institute, University of Vermont, and author of At Home in the Universe, Investigations, and others"A brilliant book that unpacks the actual doing of Big Science, including the epistemological, human, and management dimensions of running perhaps the most complex scientific experiment ever done by mankind. These different perspectives are then neatly interwoven through the Boisot I-Space framework bringing insight and coherence to this global effort. Although I have followed the development of I-Space over the years, I have never fully understood its potential until I read through this book, not once but twice. This book breaks so much new ground it is a must read for academics, policy workers, and those responsible for running complex RD efforts in a global economy."--John Seely Brown, Former Chief Scientist, Xerox Corp., and Director of Xerox Palo Alto Research Center (PARC); Co-Chair, Deloitte Center for the Edge; and Visiting Scholar and Advisor to the Provost, University of Southern CaliforniaAbout the AuthorMax Boisot is Professor at ESADE in Barcelona, Associate Fellow at the Said Business School, Oxford University, and Senior Research Fellow at the Snider Center for Entrepreneurial Research, The Wharton School, the University of Pennsylvania. Between 1984 and 1989 he was Dean and Director of the China-Europe Management Program in Beijing. This has since evolved into the China-Europe International Business School (CEIBS) in Shanghai. Max Boisot has published in Administrative Science Quarterly, Organization Science, Research Policy, and The Journal of Evolutionary Economics. His book, Knowledge Assets: Securing Competitive Advantage in the Information Economy (Oxford University Press, 1998) was awarded the Ansoff Prize for the best book on strategy in 2000.Markus Nordberg is the Resources Coordinator of the ATLAS project at CERN, Switzerland, where his responsibilities include budget planning and resources allocation for the ATLAS project. He has also served as Visiting Senior Research Fellow at the Centrum voor Bedrijfseconomie, Faculty ESP-Solvay Business School, University of Brussels, and as a member of the Academy of Management, Strategic Management Society and the Association of Finnish Parliament Members and Scientists, TUTKAS. He has a degree both in Physics and in Business Administration.Said Yami is associate Professor at the University of Montpellier 1 and Professor at EUROMED Management (France) in Strategic Management. He has published many research articles and several books. His main research relates to competitive relationships through

the topics of rivalry and disruptive strategies, collective strategies, and coopetition. He also develops research on entrepreneurship and strategy in high-tech industries. His main field of analysis is the knowledge-based economy. Among his more recent publications is Coopetition: Winning Strategies for the 21st Century (edited by Yami S, Castaldo S., Le Roy F., and Dagnino G.B.; Elgar 2010).Bertrand Nicquevert is a Project Engineer at CERN. Within the ATLAS collaboration, he held various positions: as a member of the technical coordination, he was in charge of the geometrical integration; he led the technical design office; he was the project leader of the main ATLAS structure; and the coordinator of various zones, such as the so-called shielding disc. He then joined the Large Hadron Collider installation coordination, and worked on the design of the next generation of linear colliders. He is now work package holder for the integration and design of the MedAustron project for oncological hadrontherapy. In addition to his function of engineer, Bertrand Nicquevert has taken part of various research programs, in the field of history and sociology of science (with Peter Galison from Harvard University), and of design research, mainly in close collaboration with the Grenoble University.