

Bookshelf

Qu'est-ce que le boson de Higgs mange en hiver et autres détails essentiels

By Pauline Gagnon

MultiMondes

Hardback: €29

E-book: €19

Also available at the CERN bookshop

Pauline Gagnon est bien connue dans la communauté des expérimentateurs au LHC car, en plus de sa contribution à l'expérience ATLAS, elle a été membre du groupe de communication du CERN de 2011 à 2014 et sur le blog *Quantum Diaries* elle a couvert de nombreux événements récents liés à l'activité scientifique du laboratoire.

Le titre de son livre rédigé en français, « Qu'est ce que le Boson de Higgs mange en hiver » est quelque peu trompeur, car les propos de l'auteur vont bien au delà de la description du mécanisme de Brout-Englert & Higgs et de la découverte expérimentale du boson de Higgs en 2012. Son livre offre non seulement une vue d'ensemble de la physique étudiée dans les expériences au LHC, du complexe d'accélérateurs et de détecteurs réalisés pour cette recherche et des méthodes statistiques employées pour la découverte du Boson de Higgs, mais inclut aussi un chapitre qui décrit l'organisation originale (et probablement unique) des grandes collaborations internationales en physique des hautes énergies ainsi qu'un chapitre sur les transferts de technologie et de connaissance de notre domaine vers le monde économique et le grand public.

Le livre décrit aussi les liens qui relient la physique des hautes énergies à l'astrophysique, avec un chapitre consacré aux évidences expérimentales qui ont amené à augurer de l'existence de la matière noire, et à une comparaison entre le potentiel de découverte de celle-ci par des expériences sur et hors accélérateurs. Un autre chapitre est consacré à la super-symétrie, la théorie actuellement la plus populaire au delà du modèle standard pour répondre aux questions que celui-ci ne peut résoudre, et aux défis qui attendent les expériences du LHC dans les prochaines années. Le livre se termine par la discussion d'un thème qui est quelque peu déconnecté mais cher au cœur de l'auteur, à savoir la question de la diversité (en particulier l'emploi des femmes) dans le monde de la recherche scientifique.

Le livre n'est pas destiné aux spécialistes mais cible le grand public. A cette fin, l'auteur a banni toute formule mathématique et utilise souvent des analogies pour introduire les différents concepts. Les parties plus complexes ou plus détaillées



sont incluses dans des encarts séparés que le lecteur peut éventuellement sauter. Dans le même esprit, chaque chapitre se termine par un résumé d'une page environ qui permet une lecture abrégée du point traité, quitte à y revenir plus tard. Le style est simple et direct, avec souvent une pointe d'humour. Le discours n'est cependant pas superficiel, et il me semble que le livre s'adresse tout de même à des lecteurs avec une certaine connaissance scientifique de base, par exemple des jeunes étudiants qui veulent comprendre l'intérêt et les buts de la recherche en physique des particules.

● *Philippe Bloch, CERN.*

The Singular Universe and the Reality of Time: A Proposal in Natural Philosophy

By Roberto Mangabeira Unger and Lee Smolin

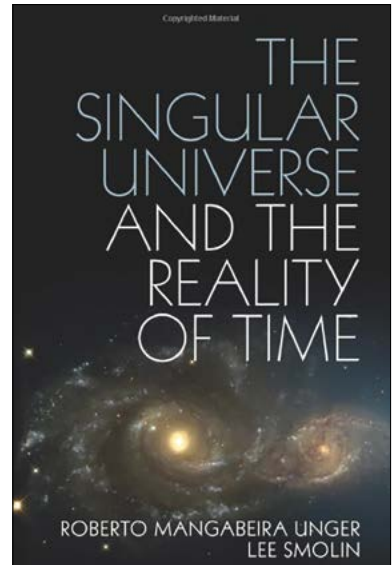
Cambridge University Press

Hardback: \$20

E-book: \$17

This is a book on natural philosophy, a field that the authors argue, and convincingly so, has not had much activity for a long time. It is definitely not a popularisation, although it is written clearly enough (and free of equations) that it should be accessible to most knowledgeable readers.

In many ways, this is two books: one of about 350 pages by Unger, a philosopher, and another of about 150 pages by Smolin, a physicist, each presenting overlapping but often dissenting views, together with a discussion of these differences. This means



one can be quite comfortable reading it and agreeing or not, as each point is raised.

Perhaps the key idea is that history might play a role in determining why the universe is the way it is, in as fundamental a way as history determines much of biology. This takes on many of the fundamental assumptions that go into cosmology and physics, including the idea that the "laws" of physics are somehow hard-wired into the universe and that they could conceivably evolve. Indeed in biology, the laws that govern biology emerge as the space of living things evolves. This puts causal connections in the driving seat and is akin to taking the Darwinian viewpoint in biology over the creationist myth. A new view emerges on why things are the way they are – an alternative to some hypothetical "elegant(?)" future derivation of why, for example, masses and couplings are what they are.

The authors eschew some ideas that often occur today, including that of there being a multiverse with ourselves being in but one (the "singular" in the title means there is just one), and the idea that time is somehow not real and leading to a genuine history. They even argue that mathematics may not merit the ("prophetic", as they put it) role that we often give it.

It's a hard book to put down. Whether or not one agrees with the points that are raised, the book is nothing if not thought-provoking, and the ideas could well be revolutionary.

● *John Swain, Northeastern University.*

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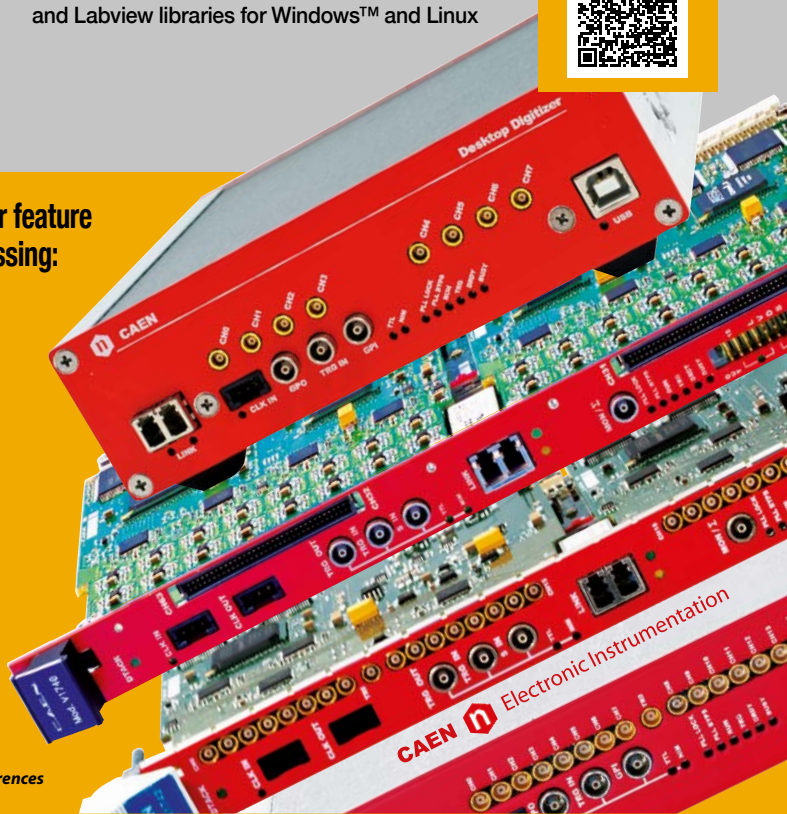
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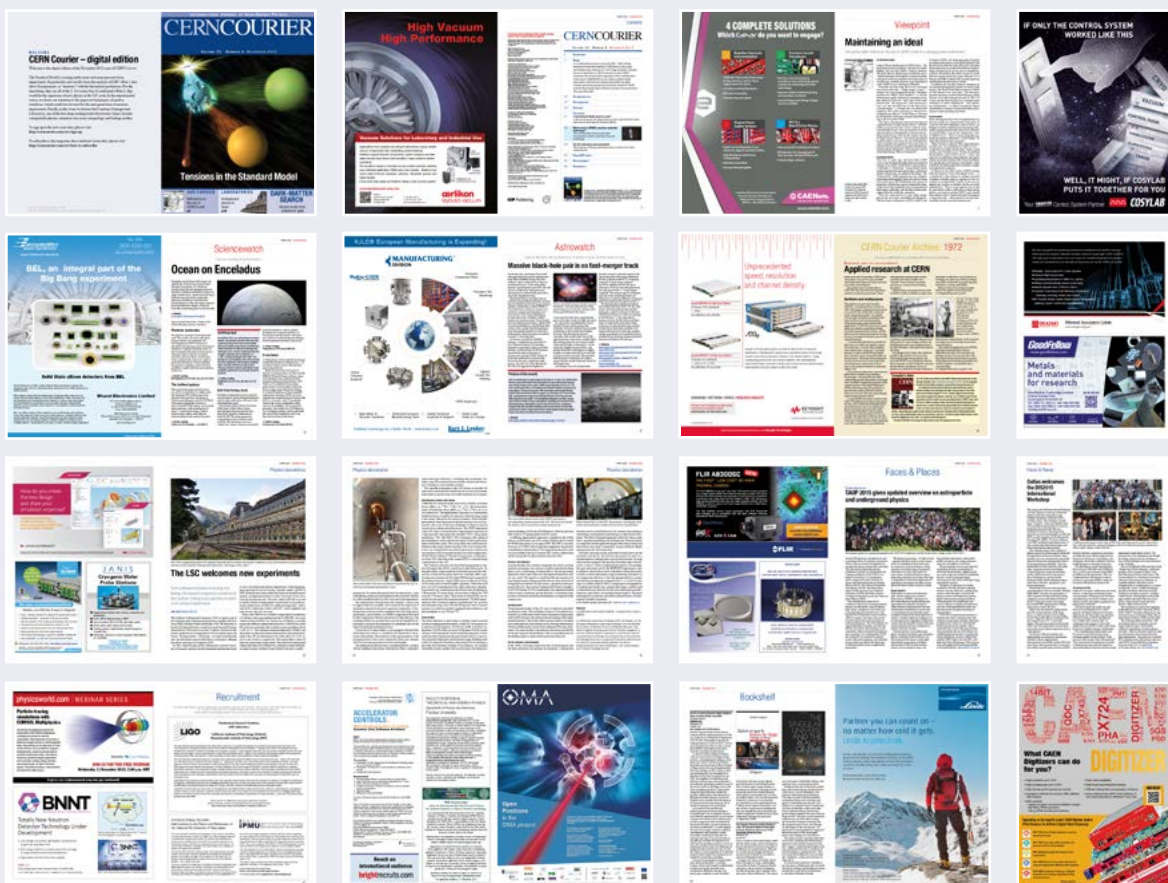


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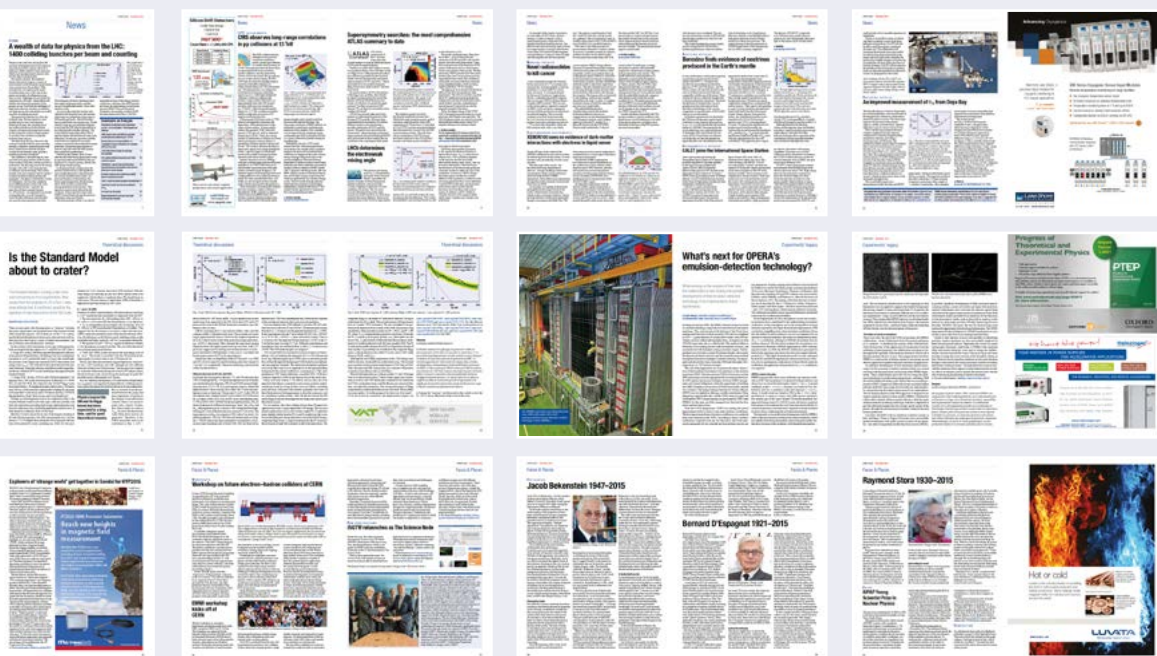
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WELCOME

CERN Courier – digital edition

Welcome to the digital edition of the November 2015 issue of *CERN Courier*.

The Standard Model is coming under more and more pressure from experiments. In particular, new results from the analysis of LHC's Run 1 data show discrepancies, or “tensions”, with the theoretical predictions. For the time being, they are all of the $2-3\sigma$ variety but, if confirmed at Run 2, they would be the signatures of new physics at the TeV scale. In the experimental sector, we direct our attention to the improved techniques of nuclear emulsions, which could also be used for the next generation of neutrino experiments. Finally, in this issue we feature the Canfranc Underground Laboratory, one of the four deep-underground laboratories where, besides astroparticle physics, scientists also carry out geology and biology studies.

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