

F-I. be vs Interuniversity Attraction Pôle VII/37

From the start, we kept 2 (quite clearly linked) activities :

- F-I.be is an attempt to provide a common platform to all groups interested in fundamental interactions
One typical service is the common agenda (<http://agenda.irmp.ucl.ac.be/PAI/month.php>), which gives access to all activities
- IAP VII/37 is the 3rd and latest phase of the “Fundamental Interactions” pôle, which involves a significant number of these groups and also provides some services to the community at large (e.g. : WP 8: future experiments)



December 2012

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
25	26	27	28	29	30	1
	● 2:00 llbb CP3		● 12:30 ULB PhysTh journal club ● 1:00 Invited Seminar - Chiara Arina - Asymmetric Cold Dark Matter from Leptogenesis	● 10:00 Bi-Weekly IIHE Internal Seminar: Martin Casier, "Studying Gamma Ray Bursts and Active Galactic Nuclei Emissions with IceCube: Method and Statistical Analysis" - IIHE	● 11:00 ULB PhysTh seminar, M. Muehlleitner (Karlsruhe U.); "Physics of the Brout-Englert-Higgs Boson in the SM and Beyond at the LHC" ● 11:30 Drink Saint-Eloi ● 2:00 Search for high-mass dilepton resonances with the ATLAS detector (Dr. Tracey Berry) - IIHE	
2	3	4	5	6	7	8
	● 2:00 llbb CP3	● 11:00 LHC phano meeting - Mr. Mathieu Buchkremer - Long-lived quarks : areview ● 6:00 Canceled - Tier-2 / Madgraph / Cosmo / NA62 clusters: Shutdown	● 6:00 Canceled - Tier-2 / Madgraph / Cosmo / NA62 clusters: Shutdown ● 12:30 ULB PhysTh journal club ● 1:00 Invited seminar - Andrea Romanino - Simple and direct communication of dynamical supersymmetry breaking	● 10:00 Bi-Weekly IIHE Internal Seminar: Thierry Maerschalk, "High-Eta Upgrade for CMS : Triple-GEM" - IIHE	● 11:00 PhysTh seminar: E.-J. Chun (KIAS-Seoul); "LHC Phenomenology of Type II Seesaw". ● 2:00 DM@BXL meeting	
9	10	11	12	13	14	15
	● 2:00 llbb CP3		● 12:30 ULB PhysTh seminar, Michele Redi (CERN); "Axion-Higgs Unification". ● 12:30 ULB PhysTh journal club ● 1:00 Lunch seminar - Marco Zaro - aMC@NLO phenomenology at the LHC ● 4:30 Mathematica: unavailable / License server upgrade			
16	17	18	19	20	21	22
	● 2:00 llbb CP3		● 12:30 ULB PhysTh journal club ● 1:00 Lunch seminar - Krzysztof Piotrzkowski - Exclusive physics at the LHC	● 9:45 IAP kick-off meeting		
23	24	25	26	27	28	29
	● 2:00 llbb CP3		● 12:30 ULB PhysTh journal club			
30	31	1	2	3	4	5
	● 2:00 llbb CP3		● 10:00 Fréchet veut faire une thèse			

Legend:

- Common activities
- CP3
- IIHE
- Joint Seminars THEP
- Antwerpen HEP events
- ULB PhysTh
- IFPA (Ulg) seminars
- HEP Gent
- Printer Friendly
- Preferences

Jump to:

Jump to: All Combined, 2012, December 2012, Dec 9 - Dec 15

Pick multiple:

- 0_common
- 1_CP3
- 2_IIHE
- 3_Joint-THEP
- 4_Antwerpen

November 2012

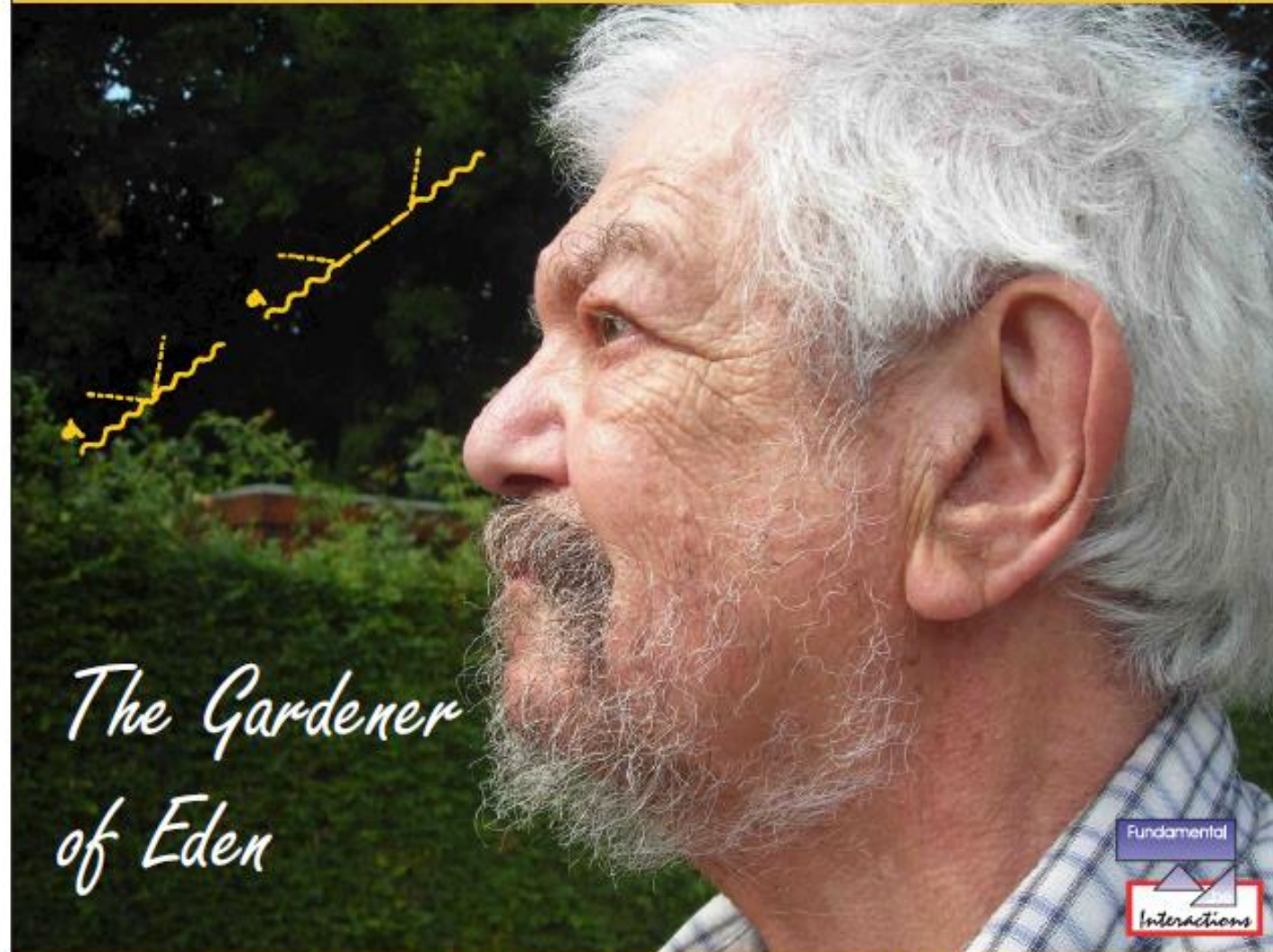
S	M	T	W	T	F	S
28	29	30	31	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	1

January 2013

S	M	T	W	T	F	S
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	2

Bière Triple

alc 7.5% (vol.) 75 cl



*The Gardener
of Eden*

Cuvée Robert Brout 2017

Bière artisanale refermentée en bouteille
Brasserie de Silenrieux S.A. B-5630
Consommer de préférence avant fin 2018





Inter-University Robert Brout Prize 2017

Awarded to the Master's Thesis

*In Ice veto studies
for the future IceCube-GEN2
neutrino observatory*

by Paul Coppin

Inter-University Attraction Pole «Fundamental Interactions» board members

Inter-University Robert Brout Prize 2017

Awarded to the Master's Thesis

*Effets des corrections
de la chromodynamique quantique
sur la recherche indirecte
d'un candidat de matière noire*

by Jérôme Vandecasteele

Inter-University Attraction Pole «Fundamental Interactions» board members



Inter-University Robert Brout Prize 2016

Awarded to the Master's Thesis

*Étude des leptons taus
et recherche de
nouvelle physique
avec le détecteur CMS*

by Diego Beghin

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Inter-University Robert Brout Prize 2016

Awarded to the Master's Thesis

*A Conformal Approach to $N = 3$
Supergravity in Four Dimensions*

*by
Jesse van Muiden*

Inter-University Attraction Pole «Fundamental Interactions» board members

IAP (final) meeting Brussels, ULB, Thursday December 21st, 2017

Speaker					
chair	Catherine de Clercq				
		Welcome	10:00	10:00	10:10
Thomas	Hertog,	Fundamental Physics with Gravitational Waves: Prospects		10:10	10:40
Didar	Dobur	LHC with multi-leptons: from SM to new physics		10:40	11:10
Steven	Lowette	Searches for exotic signatures at the LHC		11:10	11:40
Ioana	Maris	High Energy Cosmic rays (including neutrinos) : what we know		11:40	12:10
		Robert Brout Prize 2016 and Prize 2017		12:10	12:30
chair	Jean-Marc Gérard		14:00		
Nick	Van Remortel	Steriles neutrinos and SOLID		14:00	14:30
Eduardo	Cortina-Gil	NA62 and rare decay searches		14:30	15:00
		coffee break		15:00	15:30
chair	Barbara Clerbaux				
Laura	Lopez-Honorez	Dark Portals		15:39	16:00
Marco	Drewes	The Other Neutrinos		16:00	16:30
		Concluding Remarks		16:30	16:45
		Drink (incl. Beers)	16:45		



What is next?

- A theorist's view
- An experimentalist view (Daniel Treille)

Nature's challenges

vs

Men-made problems

Strong interactions

Where are the glueballs ?

(hope from unquenched lattice ?)

Matrix elements (solving ε'/ε)

Grand unification

Needed, or fix couplings by anomaly cancellation?

Are « families » the right picture ?

Extended gauge group ? Extra dimensions ?

Is parity restored at some stage?

The scalar sector

Fundamental / composite

Mass spectrum : all these Yukawas

CP violation (CP is the natural symmetry of gauge

2 or 4-component neutrinos ?

CP and the strong Θ problem
axions (an equivalent tuning)

« hierarchy problem » (a perturbative approach
problem?)

do we really need a different mechanism
for neutrino masses (when we failed to predict charged
lepton ones) ?

Nature's challenges

vs

Men-made problems

The defeat of Antimatter

One key reason for « new physics »
leptogenesis ? Testable ?

Dark matter/dark energy

New particles, or new compact objects
(primordial black holes ?)

High energy cosmic rays

Where do they come from ? How ?

Unification with Gravity

*But do we know gravity at short distance?
(< 50 microns, --- meV scale ..)*

QFT defined beyond perturbation theory ?

An experimentalist's view of the future :

*With winter greetings from Daniel Treille
(who could not join us today)*

LHC *breaking news? mind 750 !* **HL-LHC** *upgrade², what will we get?* **HE-LHC** *2xE e-p? as an exp^t*
New and big? ILC, CLIC? *a single exp^t* **FCC/CEPC** *10 x EW scale, effect?* **μ collider** *cooling?* **CERN** *fate?*
Scenarios? SUSY? m_h *ok, GU* **ED? RS** *(radion)?* *nothing conspicuous, optimal practise of EFT?* 1401.0470
Arguments for next? discovery? test SUSY "from above"? *better meas^{ts}: rates, cleanness, polar. Which goal?*
Cost: 1705.02011 *exo workshop* 1411.1450 1504.07617 1707.06720 1606.09408 1510.07697

Plans B? LEP3? *old story!* **H factory** *($t\bar{t}$ at reduced L?), need study* **R&D:** *high B,E detectors* **AWAKE, ANA,** *etc*
Besides HE frontier \uparrow *NP light?* **3 RH ν** **axion** **LHCb** *presently alone, 1706.07808* **PSI, etc** *add to SHIP?*
 \rightarrow **HI frontier** \downarrow *EFT: g/Λ ...* **ν MSM** **SMASH** **flavours: LHCb SuperBelle** $\mu \rightarrow e\gamma, 3e$ $\tau \rightarrow 3\mu, \dots$
hep-ph/0505013 1610.05040 see Solvay Workshop 1709.00294

\rightarrow **ν physics** *big US (DUNE,..) Japan (SK, HK) China (DB, Juno, reactor spectr.?)* **τ_p** *"byproduct": HK w Mton, ..*
smaller sterile (eV) ? mass (Katrin) nature of ν : $0\nu 2\beta$ (SNemo, ..) ν mass from cosmology ($\Sigma m_\nu < 0.17$ eV)?

\rightarrow **dedicated "beyond colliders" workshop** <https://indico.cern.ch/event/644287/timetable/#20171121.detailed>
g-2 EDM *(n, e, μ p all-E ring?, conclude?)* **axion γ factory** **KLEVER, AFTER, MUonE, etc** **NA62++, SHIP, NA64++**
 1710.09742 1208.6583 1710.02504 1511.07794 *cf KOPIO fixed target for g-2* *p beam dump e b.d.*

Antimatter **ASACUSA, AEGIS, GBAR, ALPHA-g** **ELENA, FLAIR?** **muonium, etc** **P radius ? H force ? "parasitic" LHC exp^{ts}**
 \rightarrow **astro/cosmo** *who decides and follows big projects? peer review?* *1601.07222 1706.00696 1601.05087 see Exo Workshop*

Microscope **GW** *various ways* **LIGO, Virgo, Kagra, E.T. LISA (Pathfinder)** **atom interfer. (MIGA)** **pulsars array**
 1712.01176 *>10Hz* *1712.00148 cold, underground* *10⁻¹-10⁻⁴ Hz* *1 Hz* *10⁻⁶-10⁻⁹ Hz*
 1411.7998, 1210.4970, 1709.09053 1611.09911 1703.02490 1711.04435 1707.01615

Surveys *(Euclid, LSST, ACT, SPT, ALI CMB)* **Arrays: Auger', TA, CTA, LOFAR, SKA** **km³: Icecube, ICGen2, KM3Net**
DM wimps *(ν floor?)* **axion** *(IAXO, ADMX, CASPEr, Shining Wall, OK?)* **others** *(BH, machos, ..)* **DM of galactic w.length?**
 1703.10280 1611.04652 1711.08999 1602.00039 1712.02240 \downarrow 1610.08297

■ **what else ??** *What can we offer to young scientists (shared time between big and small) ?*
 nuclear astrophysics 1606.00485, etc **instrumental R&D:** *wifi, ..* **applied physics:** *medical (PET, RMN), energy, etc*
think more: basics *Witten 1710.01791 alternatives: MOND, holography, Verlinde, etc* *start telling the Universe story?*

*Inter-University
Robert Brout Prize*



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