



Welcome to the Second HEPP Workshop

**iThemba LABS – North
February 8th-10th 2016**





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Lev Okun



Dmitry Shirkov

In Memoriam

Features of the LHC Data

Higgs p_T spectrum

Jet Multiplicity

(arXiv:1407.4222,
arXiv:1408.3226,
arXiv:1508.07819, CMS PAS HIG-14-028)

Signal strength of $t\bar{t}$

(arXiv:1409.3122,
arXiv:1506.05988,
arXiv:1503.05066,
arXiv:1408.1682)

**Same sign di-leptons
with b-jets and MET**

(arXiv:1311.6736,
arXiv:1404.2500,
arXiv:1504.04605)

$t\bar{t}V$ cross-section

(arXiv:1509.05276,
arXiv:1510.01131)

**Bump in di-photon
spectrum at 750 GeV**

(ATLAS-CONF-2015-981,
CMS PAS EXO-15-004)

Z+Jets+MET

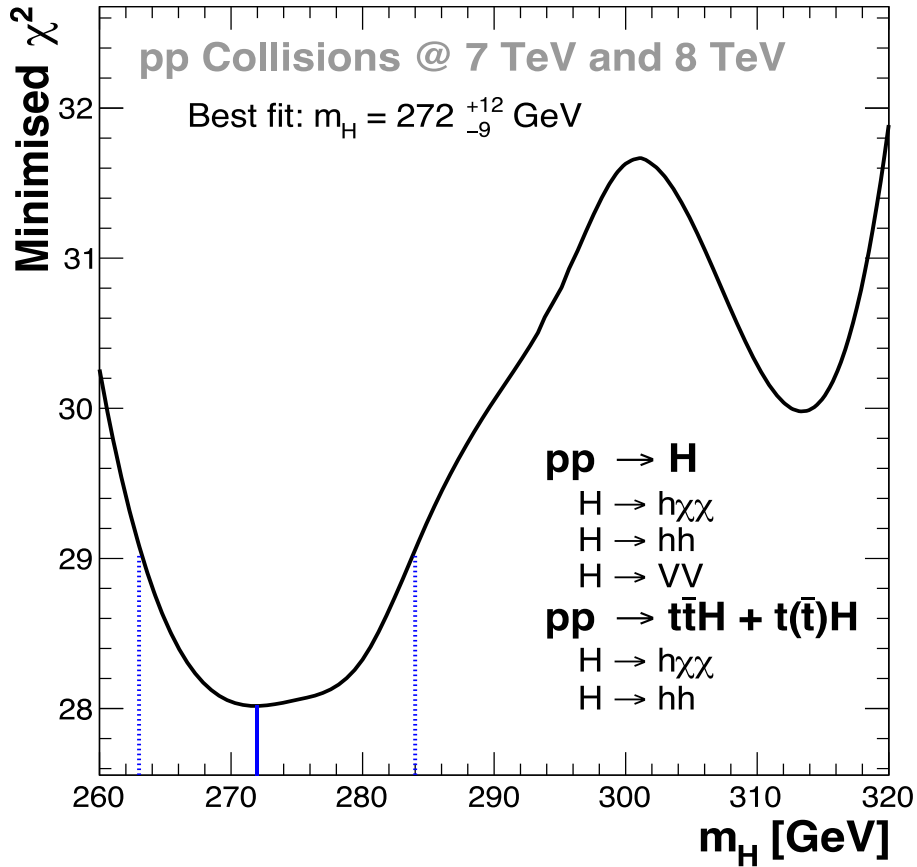
(arXiv:1502.0603,
arXiv:1503.03290,
CMS PAS SUS-15-11,
ATLAS-CONF-2015-082)

To a less extent, hh , LFV
decay of h , $h(\rightarrow b\bar{b})$ +MET

**Are these features
unrelated or are they a
manifestation of a
second Scalar Doublet?**

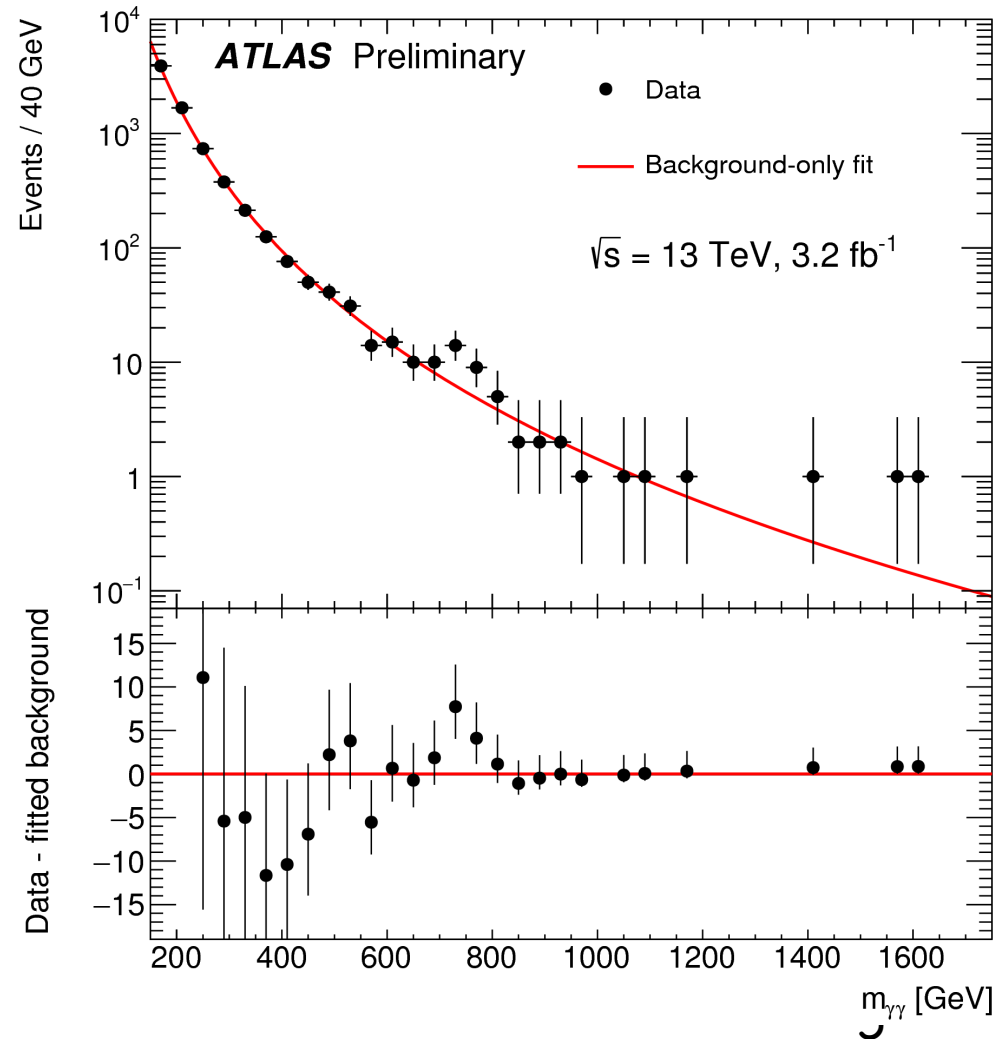
New Bosons in the LHC Data?

H(270)?



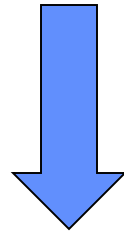
The Madala Boson

A(750)?



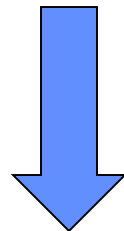
Are these a part of a new Scalar Doublet?

$h(125), H(270), A(750)$



$$A \rightarrow ZH$$

$H^\pm(650-750)$



$$H^\pm \rightarrow W^\pm H$$

**Explain a number of excesses like
Z+jet+MET, Same Sign leptons etc..**

Structure of the Workshop

High Energy Particle Physics Workshop

February 8th-10th 2016, iThemba LABS - Gauteng

The goal of this workshop is to give opportunity for students and young researchers to give presentations and to write proceedings. A morning plenary session, followed 15+10 minute presentations, shall be the format across our three days. The topics to be covered will be high-energy theory and phenomenology (heavy ions, pp, ep, ee collisions), ATLAS physics and ALICE physics. Given the format, it is expected that all MSc and PhD students will have a chance to present to their peers and senior physicists. It is envisioned to provide Honors and undergraduate students with the opportunity to perform poster presentations.

Registration and funding opportunities:

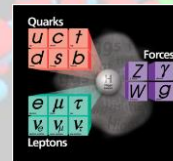
The event is open to anyone. There are funding opportunities for students outside the Gauteng Province. Visit the workshop's website for more information: <http://hep.wits.ac.za/HEPPW2016.php>

Venue:


iThemba LABS – Gauteng
Cnr Jan Smuts Ave & Empire Road, Braamfontein 2001, Johannesburg
<http://www.tlabs.ac.za/gauteng-labs-directions/>
Catering will be provided at:
Wits Professional Development HUB
92 Empire Road, Braamfontein 2001, Johannesburg
<http://wits-enterprise.co.za/welcome-to-the-wits-professional-development-hub/>

Local Organising Committee:

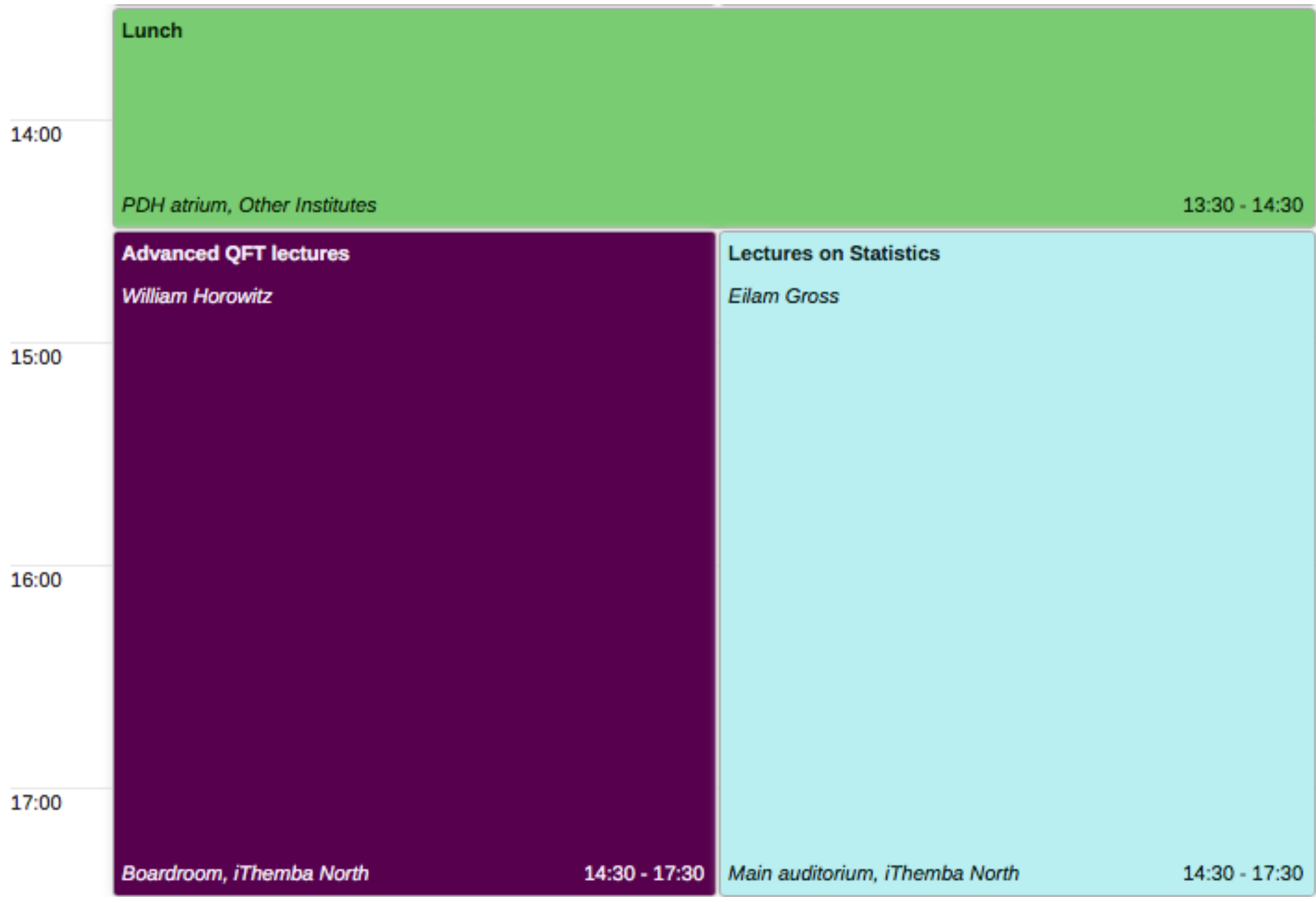
Zinhle Buthelezi (iThemba LABS)
Jean Cleymans (UCT)
Alan Cornell (Nithep/Wits, Co-chair)
Tom Dietel (UCT)
Dino Giovannoni (RU)
Deepak Kar (Wits)
Betty Kibirige (Unizulu)
Bruce Mellado (Wits, Co-Chair)
Azwinndini Muronga (UJ)
Elias Sideras-Haddad (Wits)
W. A. Horowitz (UCT)
X. Ruan (Wits)
Sahal Yacoob (UCT)



Monday February 8th

09:00	Opening Session	
	<i>iThemba LABS - North</i> 09:00 - 10:00	
10:00	QFT Lectures <i>William Horowitz</i>	Monte Carlo generator and data analysis tutorial  <i>Deepak Kar</i>
11:00		
12:00		
13:00	<i>Boardroom, iThemba North</i> 10:00 - 13:30	<i>Main auditorium, iThemba North</i> 10:00 - 13:30
	Lunch	
14:00	<i>PDH atrium, Other Institutes</i> 13:30 - 14:30	

Monday February 8th



Tuesday February 9th

09:00

Presentation session I

Jean Cleymans, Azwinndini Muronga

10:00

iThemba LABS - North

09:00 - 10:40

Break

iThemba LABS - North

10:40 - 11:00

11:00

Presentation session II

Tom Dietel

12:00

iThemba LABS - North

11:00 - 12:40

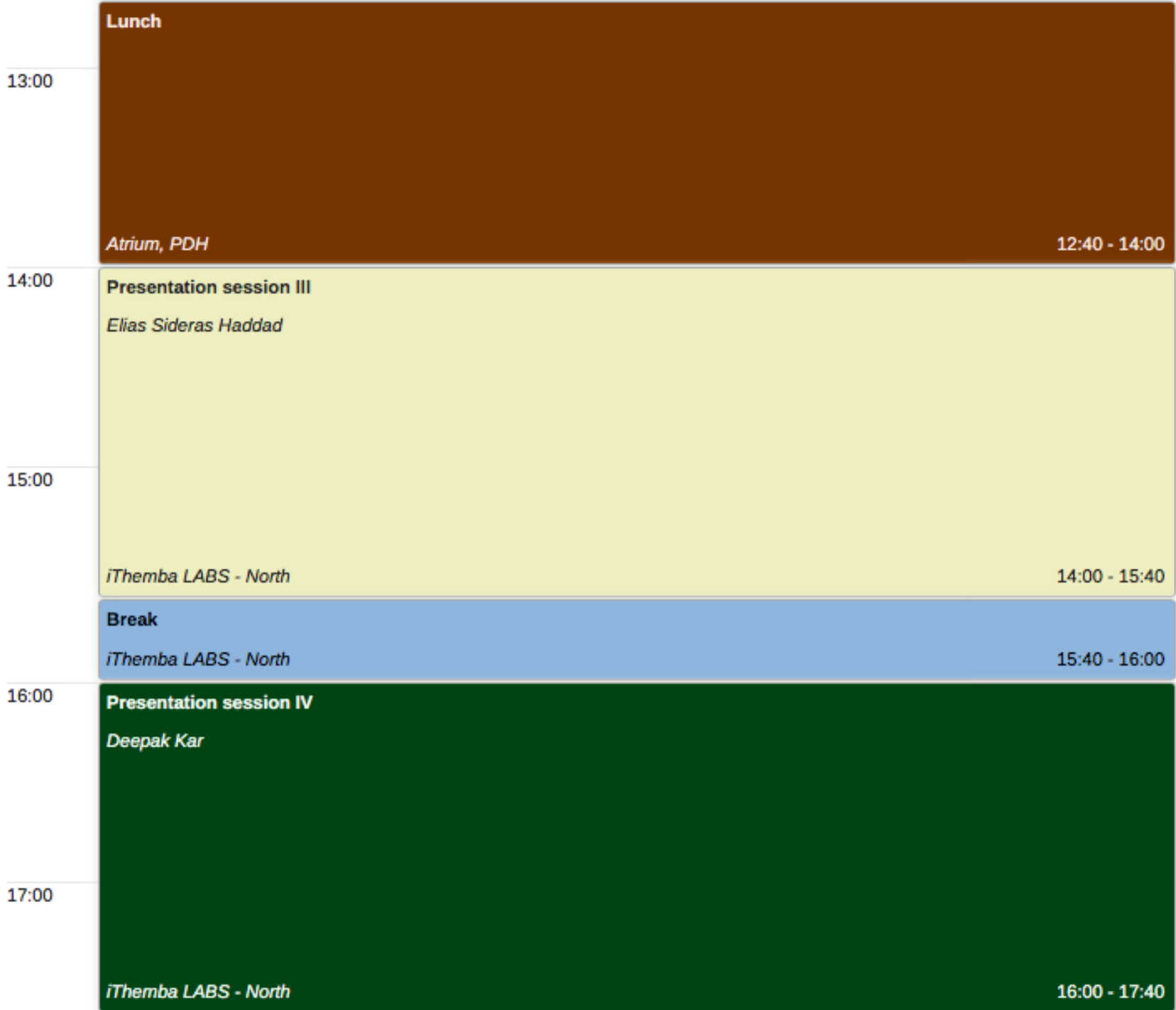
13:00

Lunch

Atrium, PDH

12:40 - 14:00

Tuesday February 9th



Wednesday February 10th

09:00	Presentation session V <i>Dino Giovannoni</i>	
10:00	<i>iThemba LABS - North</i>	09:00 - 10:40
	Break <i>iThemba LABS - North</i>	10:40 - 11:00
11:00	Presentation session <i>Dr. Betty Kibirige</i>	
12:00	<i>iThemba LABS - North</i>	11:00 - 13:00
13:00	Lunch <i>Atrium, PDH</i>	13:00 - 14:00
14:00		

Proceedings due **February 28th 2016**

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Thank you for contributing your paper to the proceedings of the [High Energy Particle Physics Workshop \(HEPPW2015\)](#).

The proceedings have just been published as **Volume 645** of *Journal of Physics: Conference Series* – an open access journal from IOP Publishing.

To increase the visibility of your research, share the link to your paper with your colleagues.

The URL of your paper is

<http://dx.doi.org/10.1088/1742-6596/645/1/012027>