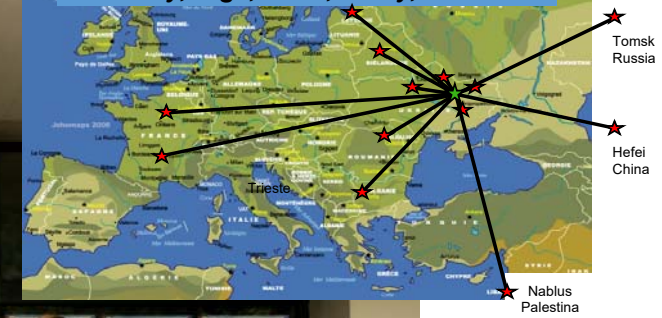




Concluding remarks

On behalf of the Organising/Program Committee

Clermont Ferrand, Dnipro, Hefei, Iasi, Kharkiv, Kyiv, Minsk, Nablus, Paris-Orsay, Riga, Sofia, Sumy, Tomsk



TESHEP 2018 - Poltava

July 13-20, 2018

<p>Experimental Particle Physics Standard Model & Beyond Instrumentation Accelerators Cosmology Statistics Topical Seminars</p>	<p>Practical Sessions Students' Conference</p>	<p>Program Committee</p> <ul style="list-style-type: none"> S. Barak (CNRS/PPS/LAL, France) Z. Borsanyi (CEISRI/LAL, France) C. Bourgin (CNRS/PPS/LAL, France) A. Boczek (IF PAN, Poland) G. Calderini (CEISRI/LAL, France) V. Dergach (IHEP, Switzerland) L. O. Gorbenko-Bocchicchio (TNSK, Ukraine) A. Yu. Korshak (IHEP, Ukraine) B. Montel (CNRS/LAL, France) D. D. Nurbekov (IHEP, Ukraine) V. M. Pugatch (IHEP, Ukraine) J. Rademacher (Humboldt-Paris, Lab, UK) S. Rappel (French Embassy, Ukraine) M. Schmelling (MPI, Germany) M. H. Schuch (CNRS/PPS/LAL, France) V. Shary (CNRS/LAL, France) A. Stoch (CNRS/PPS/LAL, France) M. Titov (CEISRI, France) <p>Advisory Committee</p> <ul style="list-style-type: none"> C. Abaz (ITP/HEI, Romania) B. Goryunov (State Agency on Science, Ukraine) N. Andronov (IHEP, Ukraine) I. Lesiak (IF PAN, Poland) F. Leves (ITP/HEI, Hungary) J. Mach (GSI, Germany) N. P. Shuf (IAI, Ukraine) V. Yu. Storchiko (IAP-Sumy, Ukraine)
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Deadline for applications: May 15, 2018
<http://teshep18.lal.in2p3.fr> Contact: teshep18@lal.in2p3.fr

20th July 2018



To the local organisers

- for making this school possible
- for the **UNPECCABLE** organisation in a such beautiful and convenient place

Thanks to

Lydia – the library manager



Alexandr – Vice Rector



The Dream Team !



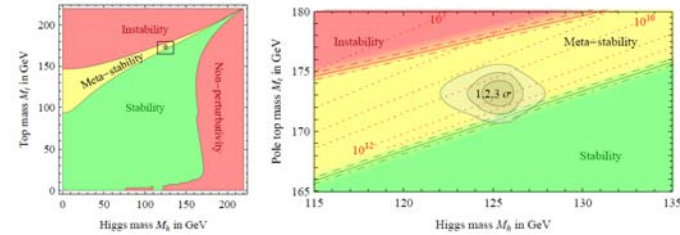
The basics...

Symmetries are of prime importance

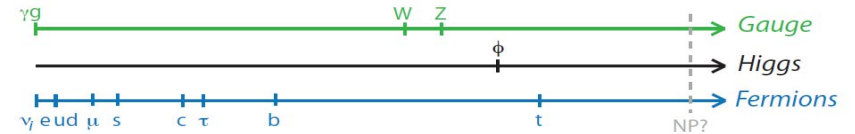
Sébastien



Quarks					Leptons
Fermions					
				Bosons	

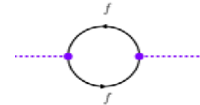


But we are all convinced that we should go beyond the SM !



- Parameters, e.g., masses, completely arbitrary
 $m_e = 0.51 \text{ MeV} \rightarrow m_t = 170 \text{ GeV}$
- Origin of electroweak symmetry breaking
most simple ϕ^4 model enough for Higgs ?

- Hierarchy "problem" with Higgs mass = O(1 TeV)



$$\Delta m_H^2 = \frac{N_f m_f^2}{4\pi^2 v^2} \left[\Lambda_{NP}^2 + 6m_f^2 \log \frac{\Lambda_{NP}}{m_f} - 2m_f^2 \right] + O \left[\frac{1}{\Lambda_{NP}^2} \right]$$

Λ_{NP} scale of new physics: fine tuning needed if no particle up to unification scale (10^{16-19} GeV ?)

- No gravitation included
- Cosmological obs: dark matter, matter-antimatter asym. ...
- No explanations for gauge group, only partial unification
- Value of the charges ? Three families ?
- Why $L \neq R$? Structure of Yukawa ? Amount of CP-violation ?
- Strong CP-problem: $\theta_{QCD} \epsilon_{\mu\nu\rho\sigma} G^{\mu\nu} G^{\rho\sigma}$ allowed, but $\theta_{QCD} \leq 10^{-10}$
- A few processes deviating from the SM at low energies...

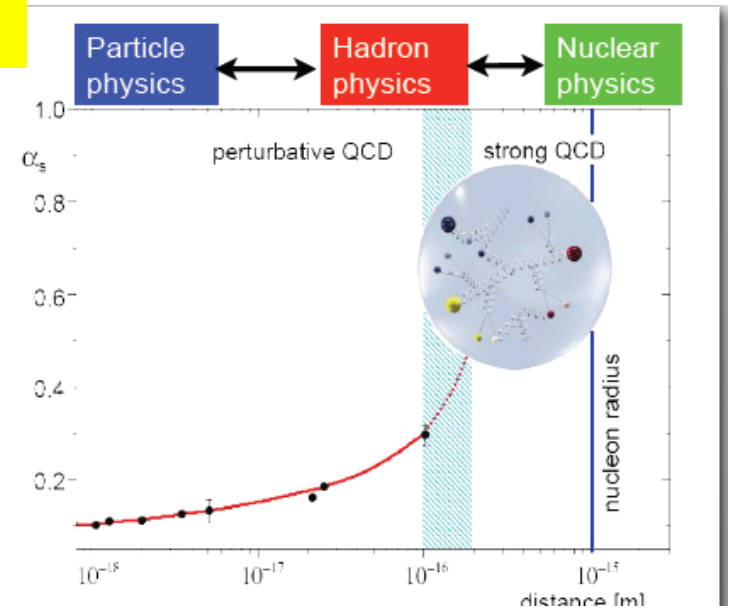
But we are all convinced that we should go beyond the SM !

Theorists have plenty of ideas to spice up the SM

Understanding the nucleon structure



Egle

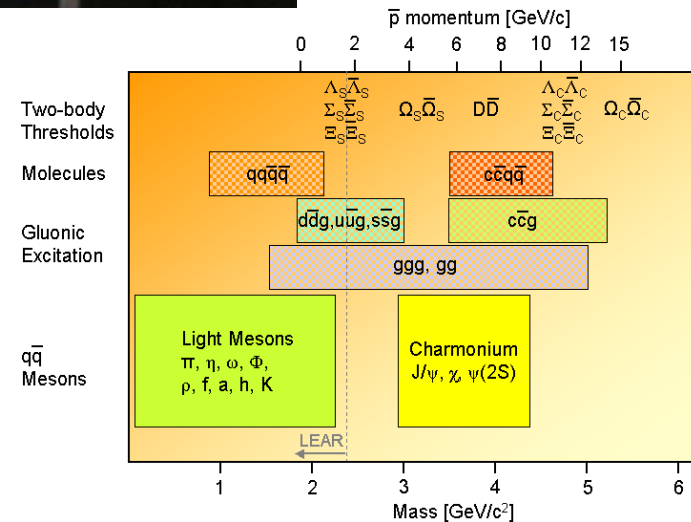


Strong interaction and hadron formation...

The important of the studies of polarised quantities

The new frontier of the spectroscopy

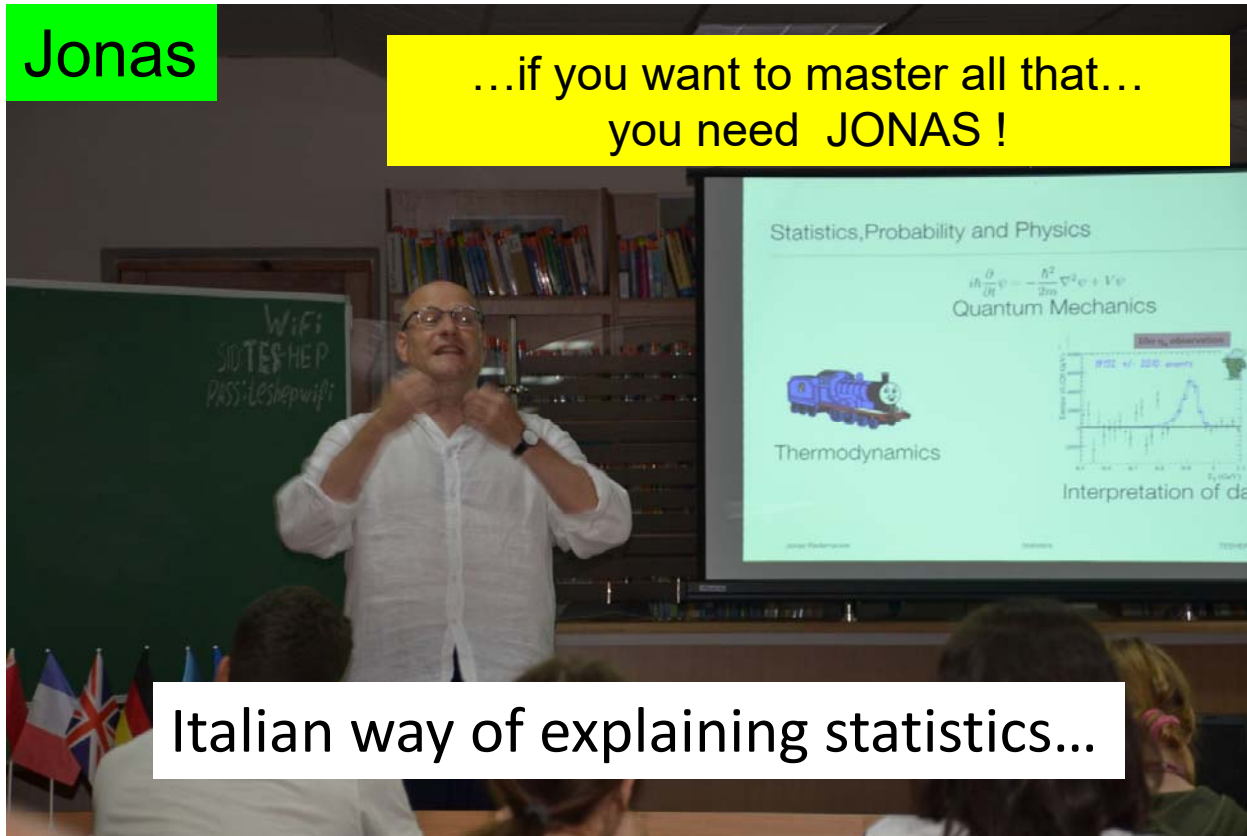
Charmonium spectroscopy, Open charm, Gluonic excitations, Hypernuclear Physics, Color transparency.....



...if you want discovery... you have to be sure...
 ...if you want precision...you have to deal with small errors...and systematics..

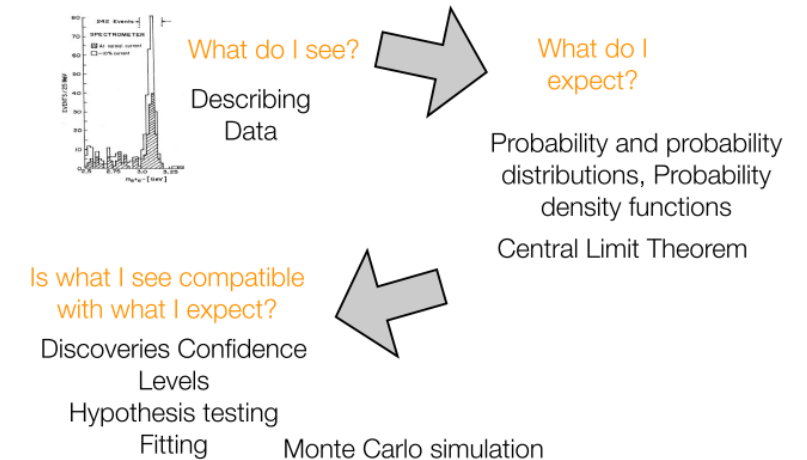
Jonas

...if you want to master all that...
 you need JONAS !



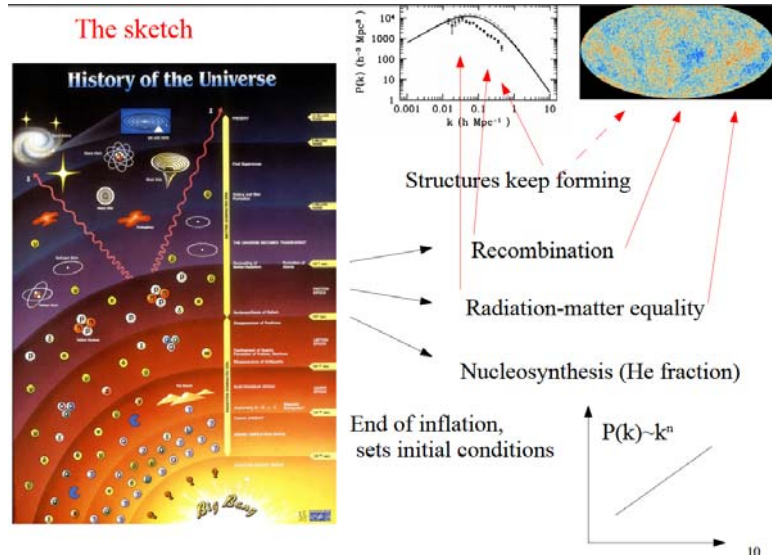
Italian way of explaining statistics...

Roadmap



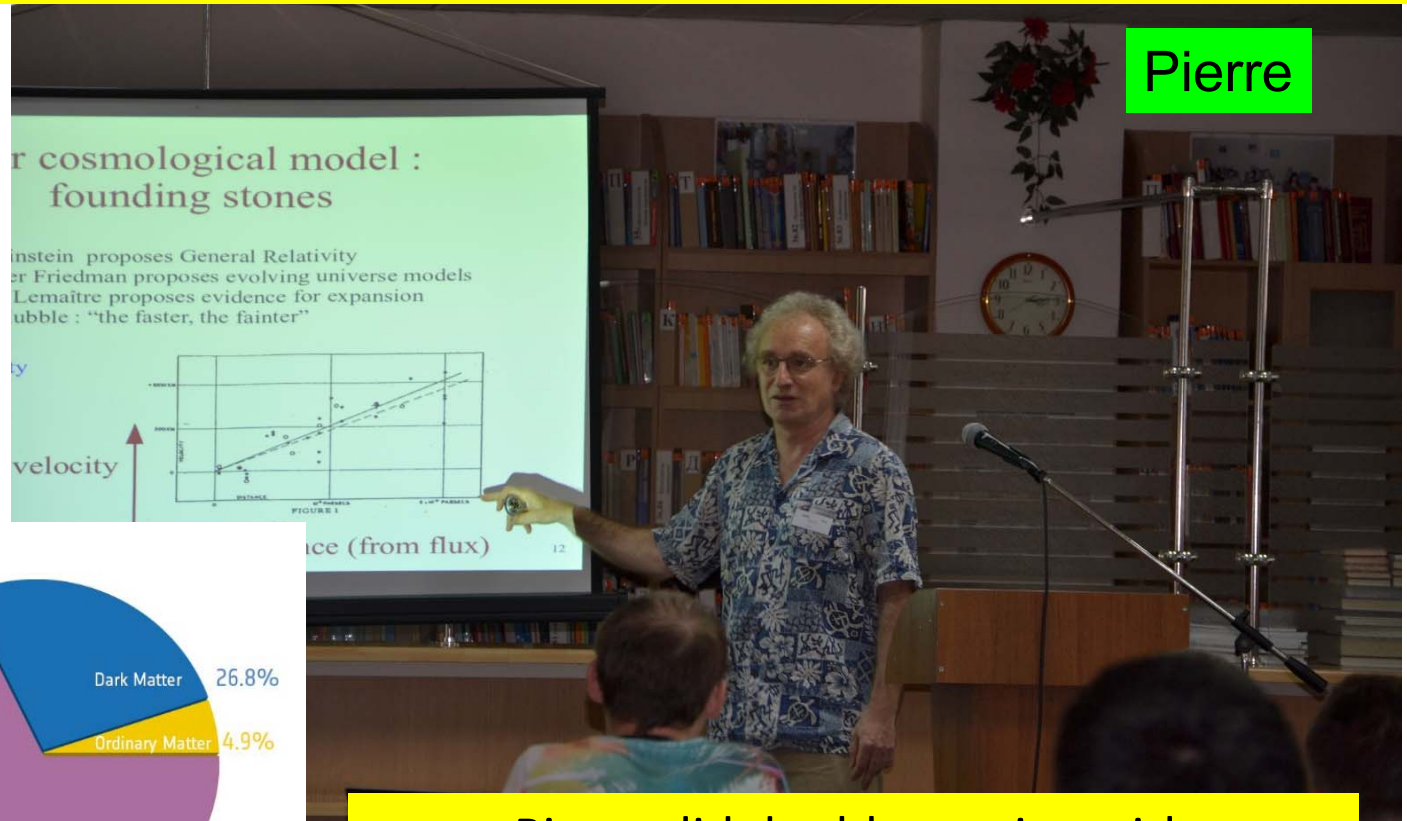
If the universe expands there could an “initial singularity”

The sketch

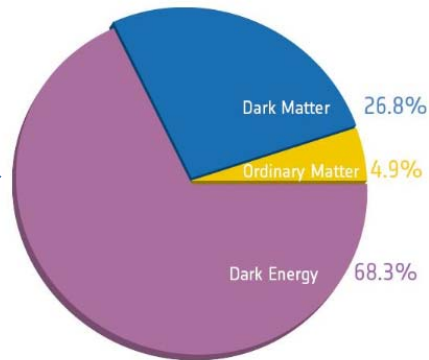
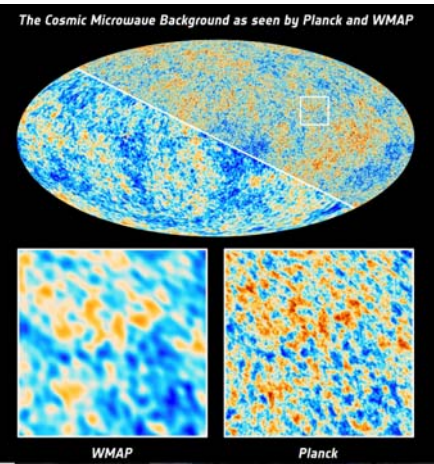


We learned from the Big Bang and the history of the universe

Cosmology : deep link and interplay between the exploration of the two Infinities



Pierre



Pierre did double service with Lectures and Practical Works !

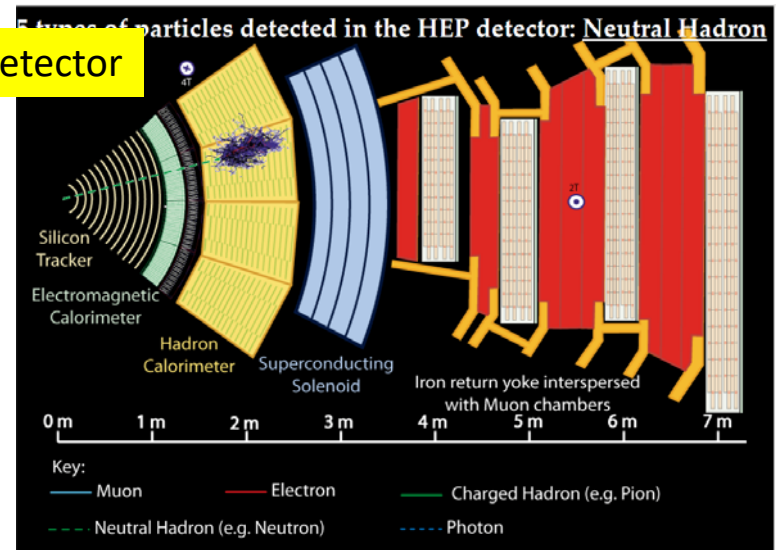
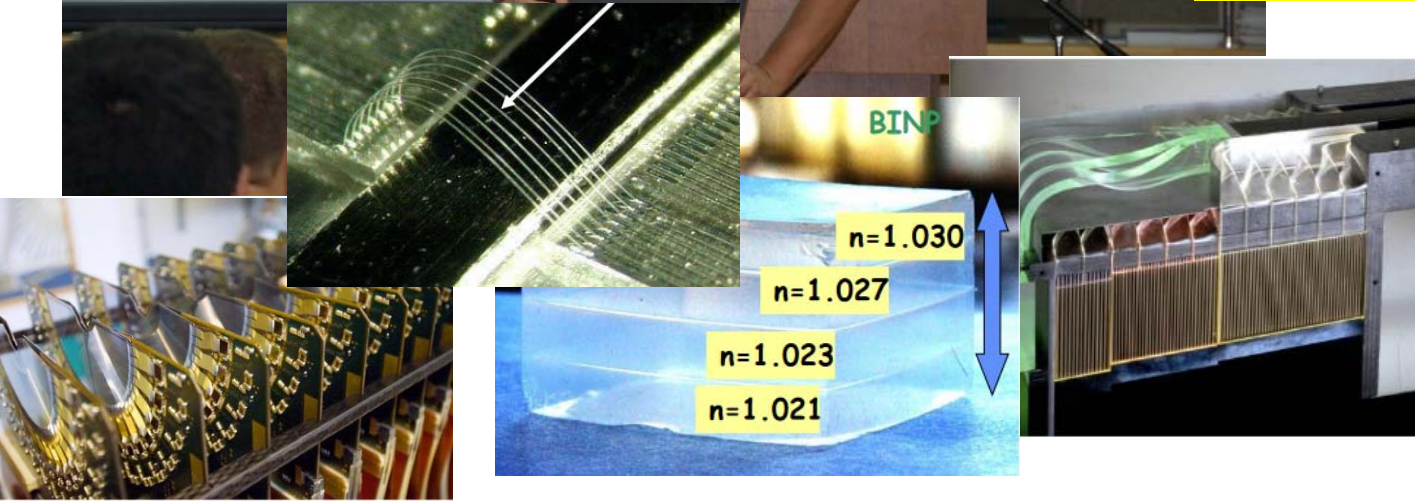
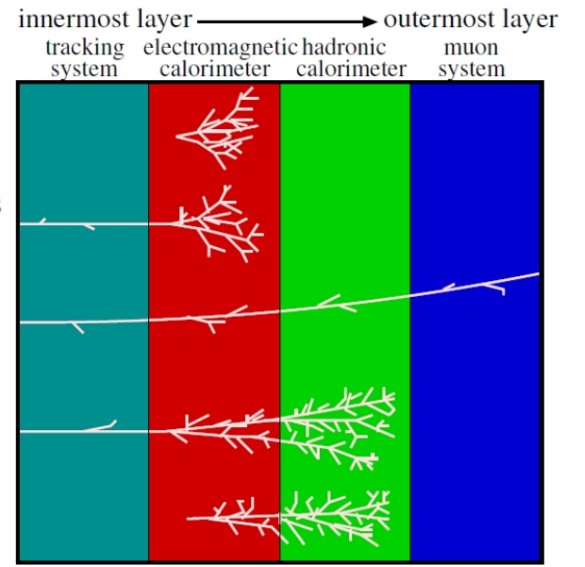
Concepts for INSTRUMENTATION and building detector



From concepts

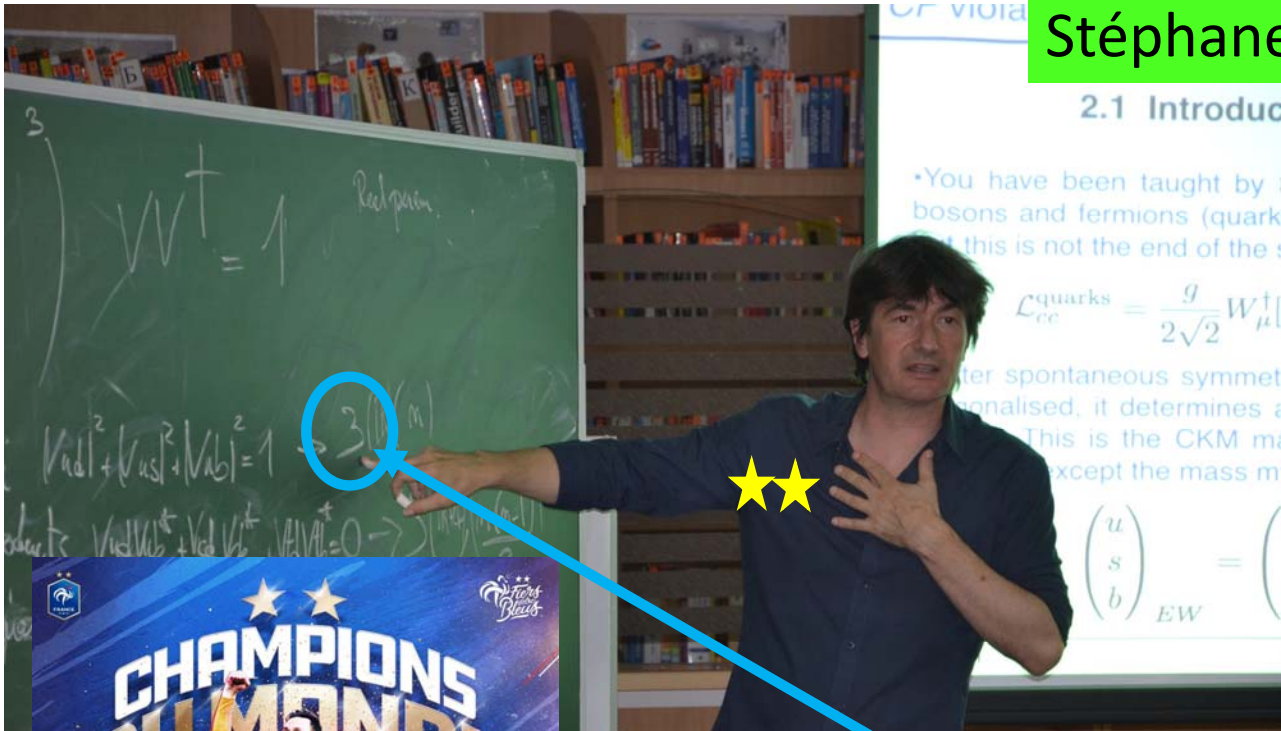


To complex detector



CP Violation : Tests of SM in the fermion sector

Stéphane



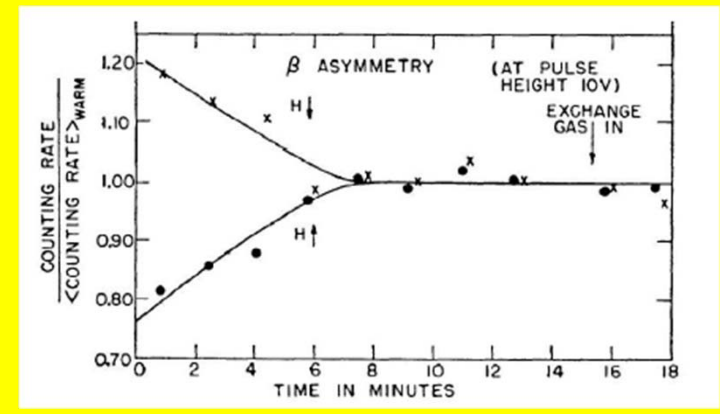
★★

ALLEZ LES BLEUS !!

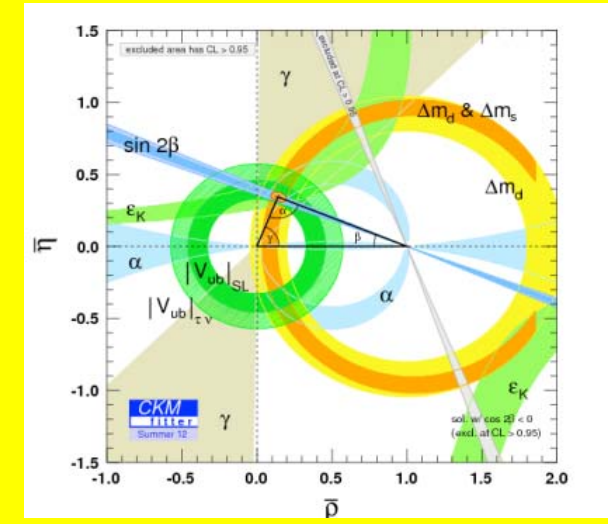
Stéphane... the starts are still 2 (not 3...)
 Wait 4 years...



From PARITY



To CP and CKM



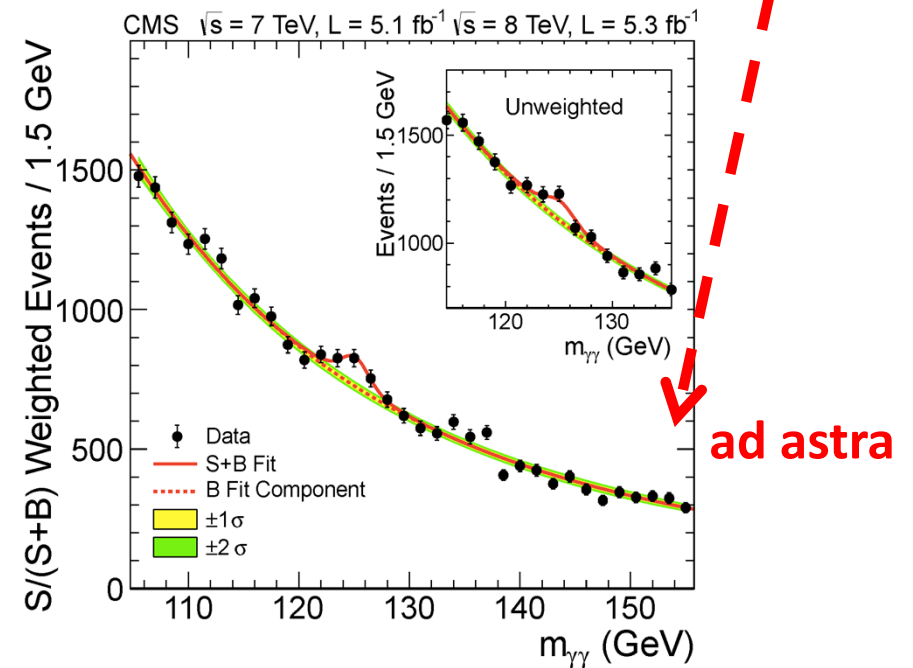
To New Physics ..hopefully !!

Higgs Story, Discovery and Future



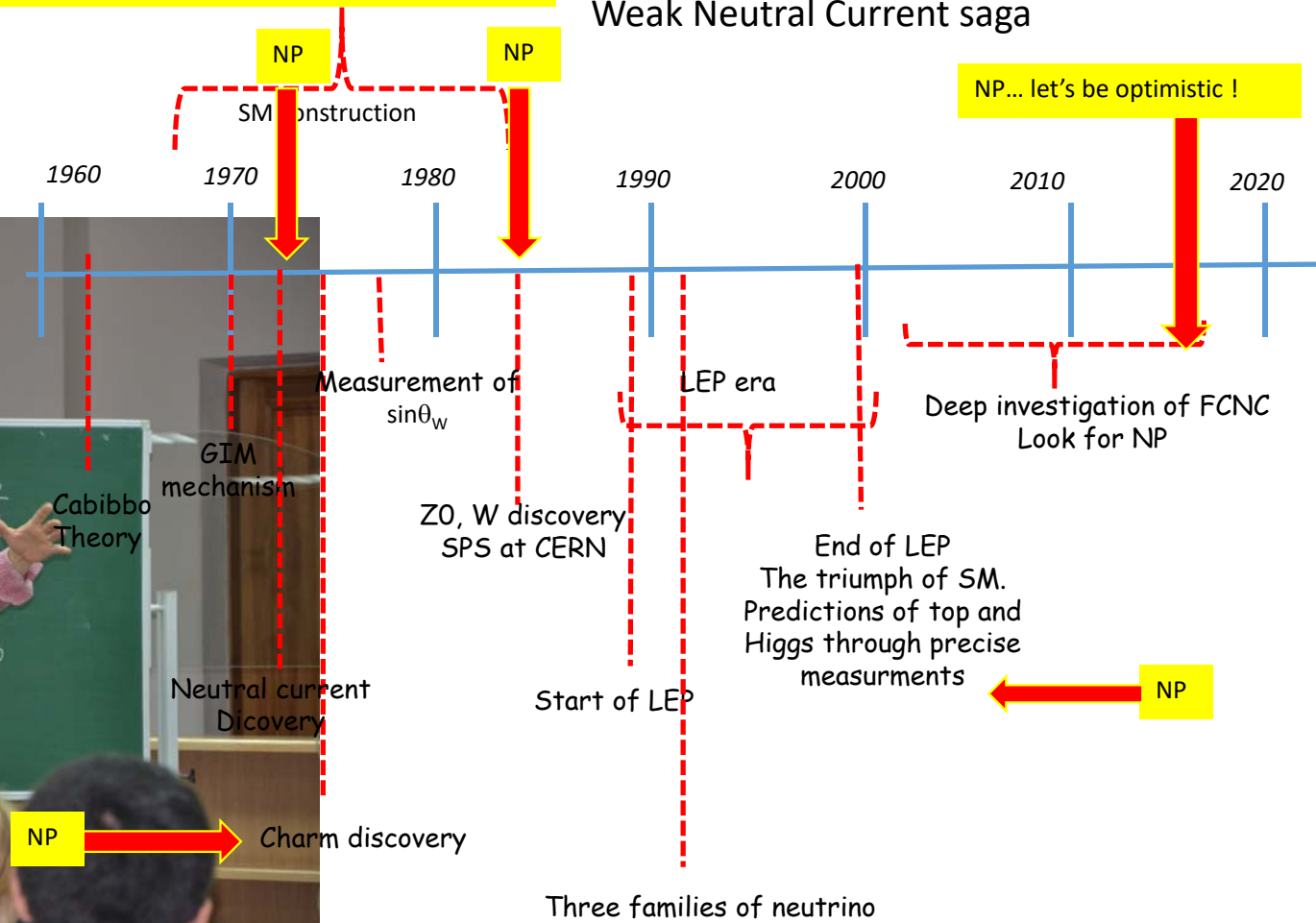
We are now in post-Higgs hera

- Precise measurements at LHC
- Future experiments



NEUTRAL CURRENT, Z0 DISCOVERY and SEARCH OF NP IN NEUTRAL CURRENTS

Weak Neutral Current saga



NP... let's be optimistic !

Achille

From theory → experiments → data analyses → statistics → theory

And you have to be smart and well educated to perform analysis...

mining the data

You need to master GEANT4 and to understand how what you measure is related to detector effects

on Geant4



Leonid

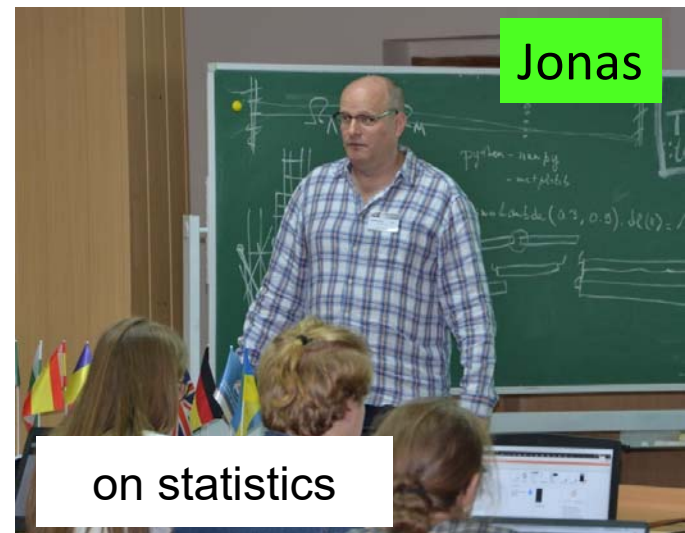
Be able to deeply understand the functioning of detectors



Andrii



Slava



Jonas

on statistics

Conference from former students !

Sergii Trofymenko, UA, 2009



Igor Kirillin, UA, 2011



Marharyta Alokhina, UA, 2011



Maksym Teklishyn, UA, 2014



Thanks !

We really enjoyed to see you again and to see that you are continuing with success !!

We had a seminar of the CERN History and his mission.

Christoph



LectureTime @ TESHEP2018

Each student has his/her own style...

But always with smile and happiness !

Asking questions with hands



... almost praying...



Taking notes !



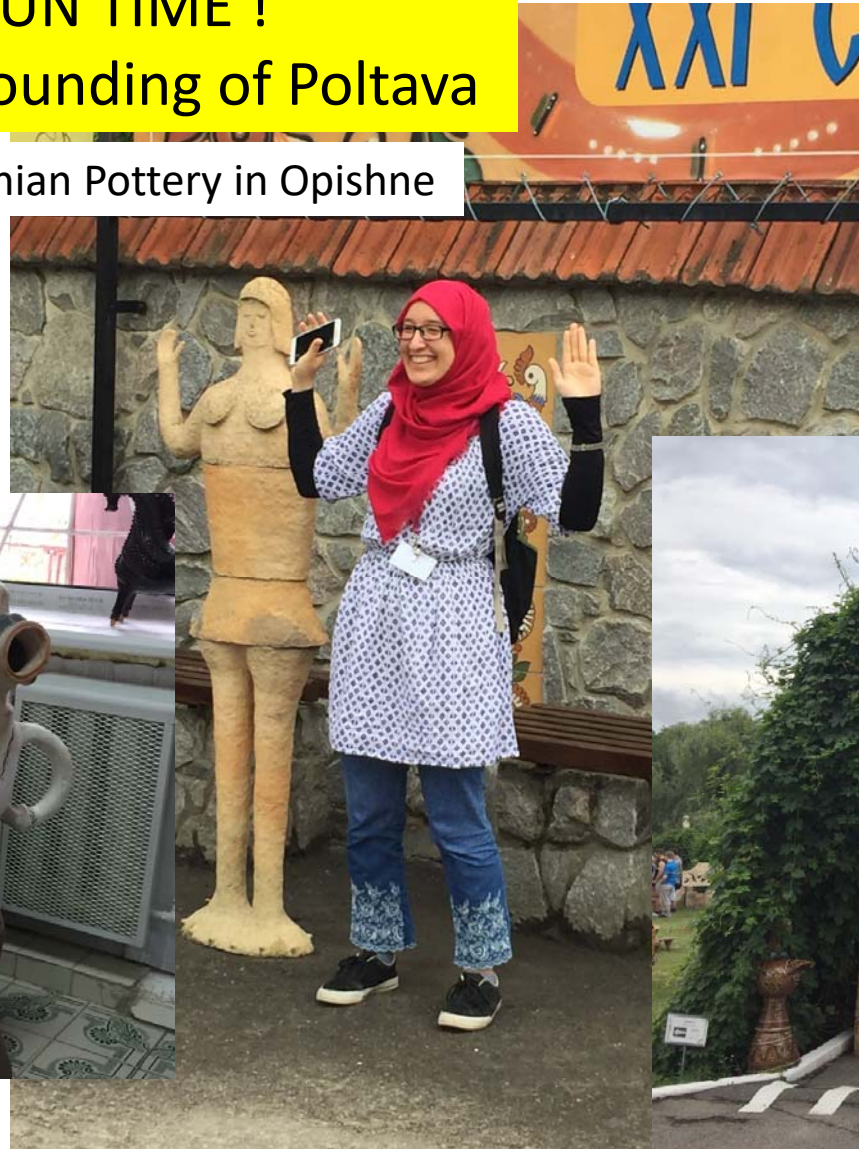
... almost always...



RELAX AND FUN TIME !

Excursion on the surrounding of Poltava

The National Museum of Ukranian Pottery in Opishne



...and the very nice church in Poltava



Football as usual as always !!



Ladies were performing well !



Spectators were passionated in the stadium !



Contacts were... friendly !!

But at the end we were all tired... and happy !! ..



... also because professors... win !

International singing sessions as usual as always !!

But this year we had many good singers !

Get starting..



Stéphane... came !



Ukrainian song..



French, spanish, palestinian, chinese, latvian, kazakhstan, romanian, italian....



We also had some extra night session !



But this it has been possible also thank to practical organization and in particular to ...

Catherine Bourge



**MANY
THANKS !!!**

Catherine Bourge
@ work

Student's presentation were good and professionally prepared...

We had a Conference

More than 30

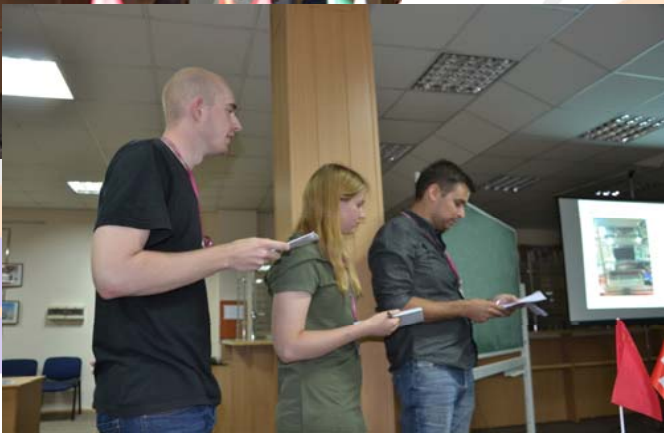
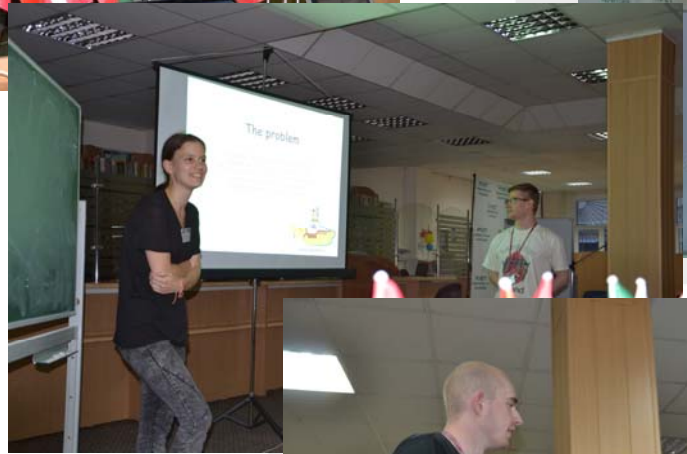
fast communications..



ALL STUDENTS WOULD DESERVE A PRIZE

Prize for physics battle

The GREEN TEAM !



Trans Eu

Prize for the best presentation



SCIENCE

But we want also to mention for their presentation :

Feng JIANXIN, Cristina MARTIN-PEREZ, Yuliia BALKOVA, Kateryna BARYNOVA,
Tamara HOLUB

Prize for the best questions

Yuliia BALKOVA



But we want also to mention for their questions and participation :
Katheryna BAYNOVA, Dmytro MELESHKO, Zhanna KHURANOVA, Manar AMER,
Oleh TROFIMIUK

Prize for the best lecture



JONAS RADEMARCKER

What next ?

In 2019 school will be organised

Hopefully....Riga at night - LATVIA




But be sure we'll come back soon to Ukraine !!

Proceeding
5pages for 1h lecture/seminar
1page for the student presentation

Deadline 15th November

*We will provide to you the template
(tex format) in two weeks time*




Trans-European School of High Energy Physics

Poltava, Ukraine
July 13-20, 2018

Experimental Particle Physics
Standard Model & Beyond
Instrumentation
Accelerators
Cosmology
Statistics
Topical Seminars

Practical Sessions
Students' Conference




Deadline for applications: May 15, 2018
<http://teschool18.lal.in2p3.fr> Contact: teschool18@lal.in2p3.fr

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- N.F. Shul'ga (NSC KIPT, Ukraine)
- V. Yu. Stozhko (IAP-Sumy, Ukraine)



We will send you a « questionnaire » by email to have your appreciation about the school and of the lectures.
Please take sometime to fill it up.
Your comments are very useful for us to improve !

Thanks for coming, have a safe
journey back home

