

Linear Collider Town Hall Meeting

5/16/12 7:04 AM



Image: DESY

- [Home](#)
- [Program](#)
- [Registration \(free access\)](#)
- [Participants](#)

At the EPS-HEP2011 conference, the European Committee for Future Accelerators (ECFA) launched the update<sup>(1)</sup> of the 2006 [European strategy for particle physics](#). The European Strategy covers the European participation in particle physics projects in Europe and beyond Europe. An international committee<sup>(2)</sup> has been established to prepare input from the linear collider community.

**On May 16**, a Linear Collider Town Hall Meeting will take place in Paris for the whole Particle Physics community to express its view to the committee in charge of drafting the Linear Collider report: the discussions at this meeting, that aims to gather the community at large, will be timely in view of preparations for the European Strategy Update.

The committee is requested to review the physics case for a linear electron-positron collider in the centre-of-mass energy range from around 250 GeV - 3 TeV in the light of the Large Hadron Collider results up to mid-2012 and building on previous studies. The committee should consider the case for a linear collider in terms of the physics reach beyond that of the LHC under the assumptions in the current CERN planning: a) 300 to<sup>2</sup> and b) 3000 to<sup>2</sup>. It should assume linear collider performance based on the details contained in current documents from ILC and CLIC but without a detailed comparison of the relative performance of the machines. The aim is to make the strongest possible case for a generic linear collider for submission to the European Strategy process. The committee is requested to submit its draft report to the ILC Global Design Effort (Stefan Stapnes) and the chair of the ECFA Study for the Linear Collider (Juan Ruster) by June 15, 2012. The final version of the report should be delivered to the European Strategy Group by the end of July 2012, as an input for the [CERN Open Symposium](#).

- (1) The timeline for the update is as follows:
- Submission deadline for inputs to the Open Symposium: July 31, 2012,
  - Open Symposium: September 10-12, 2012 (Cracow, Poland),
  - Submission deadline for inputs to the Strategy drafting session: October 15, 2012,
  - Strategy group drafting session: January 21-26, 2013 (Erice, Italy),
  - Draft Strategy finalized, March 2013 (CERN Council),
  - Strategy finalized, May/June 2013 (CERN Council, special meeting).

(2) Committee members are: James Brau, Rolini Gobbo, Franco Le Diberder (chair), Mark Thomson, Harry Weerts, Georg Weglein, James Wells and Hiroshi Yamamoto.

- [Yamse](#)
- [Contact](#)
- [Locations](#)
- [Paris](#)



Warm thanks to IN2P3 & IRFU  
and to  
Caroline Hello  
Catherine Bourge  
Sarodia Vydelingum



# Linear Collider **input** to the European Strategy



One LC input among others: they will be several. This one is meant to **express** the community view.

The European strategy  
for particle physics

It should carry a somehow **official** weight

2006

Update

2013

CERN Council

CERN Council

# Timeline for the European Strategy Update

CERN Council made it clear that it is not looking for a shopping-list.  
=> Clear priorities should be set.

CERN Council (Brussels) - *Strategy finalized*



Open Symposium  
Sept. 10-12 (Cracow, Poland)

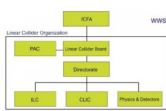
Strategy Group drafting session  
January 21-26 (Erice, Italy)

draft



(deadlines->) Open Symposium  
July 31

Strategy drafting session  
Oct. 15



By accident, at about the time when the new CLICILC world organization takes place.



## Linear Collider input to the European Strategy

### Mandate

The committee is requested to **review** the **physics case** for a **linear electron-positron** collider in the centre-of-mass energy range from around **250 GeV - 3 TeV** in the light of **LHC results up to mid-2012** and building on previous studies. The committee should consider the case for a linear collider in terms of the **physics reach beyond that of the LHC under the assumptions in the current CERN planning; a) 300 fb<sup>-1</sup> and b) 3000 fb<sup>-1</sup>**. It should assume linear collider performance based on the details contained in current documents from ILC and CLIC but **without a detailed comparison of the relative performance of the machines**. The aim is to make the strongest possible case for a **generic linear collider** for submission to the European Strategy process. The committee is requested to submit its draft report to the GDE European Regional Director, the CERN Linear Collider Studies Leader and the Chair of the ECFA Study for the Linear Collider by **June 18th** 2012. The final version of the report, should be delivered by **end July**.

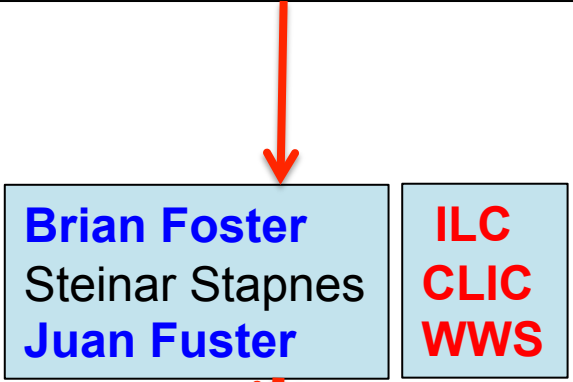
no LEP3  
or  
SuperTristan

For LHC input to the European Strategy group, will rely on LHC2TSP



# Linear Collider input to the European Strategy

## Committee Members



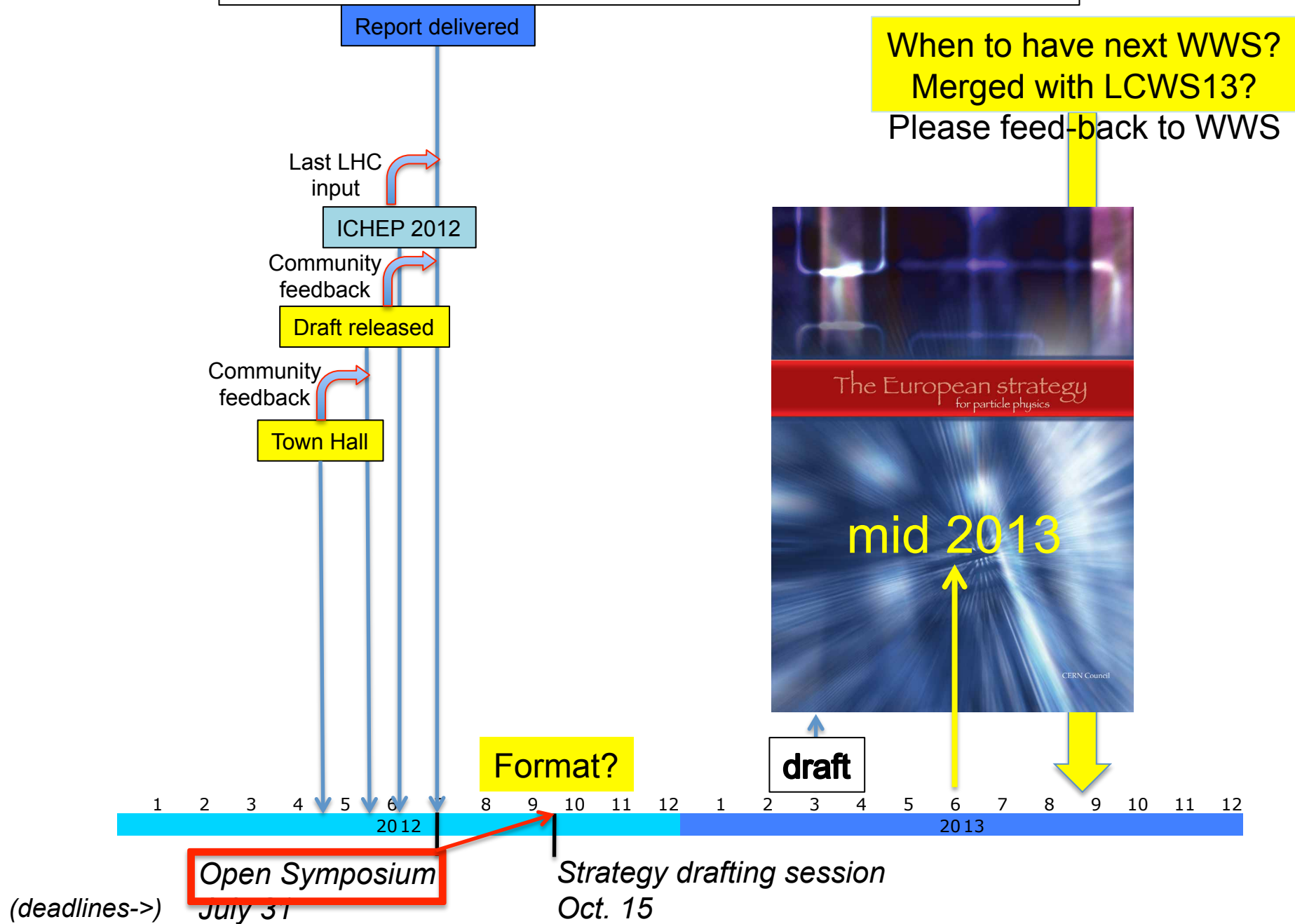
## European Strategy Preparatory Group

Kracow Open Symposium

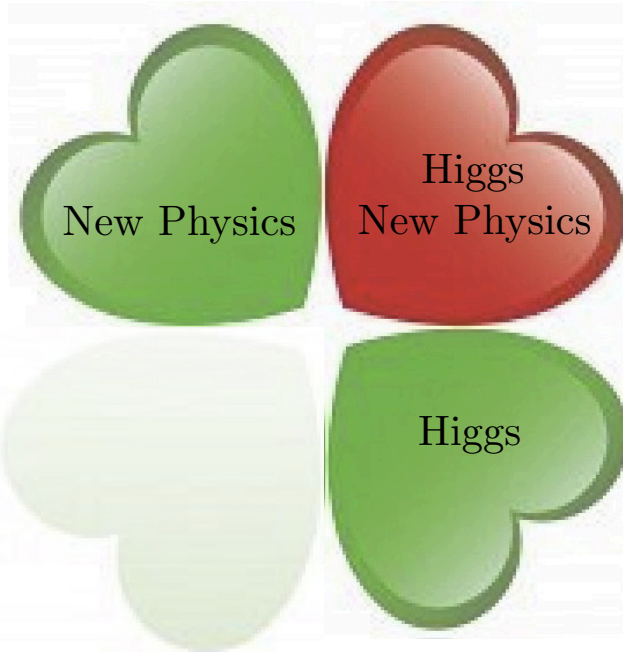
Briefing Book

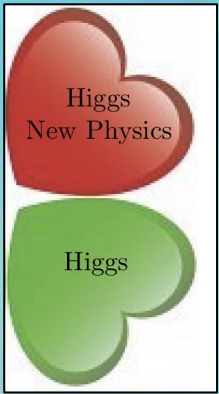
European Strategy Group

# Linear Collider input to the European Strategy

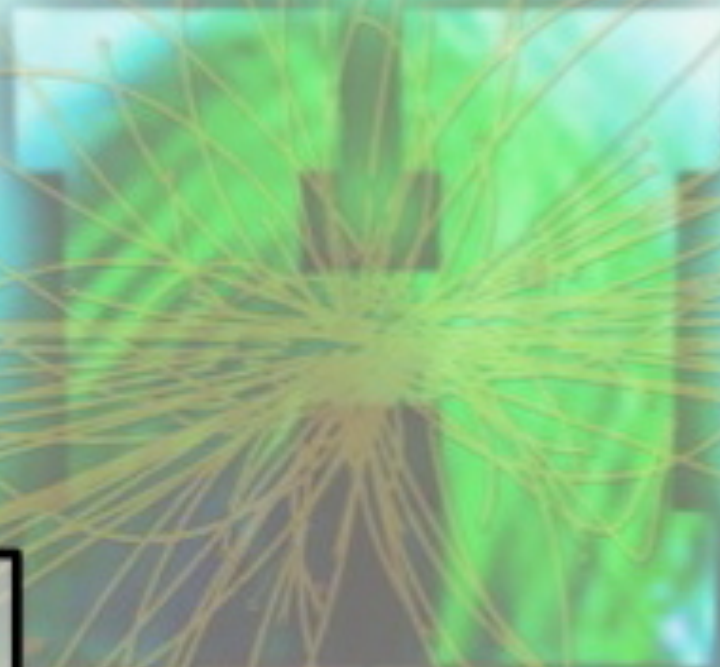


# Linear Collider input to the European Strategy





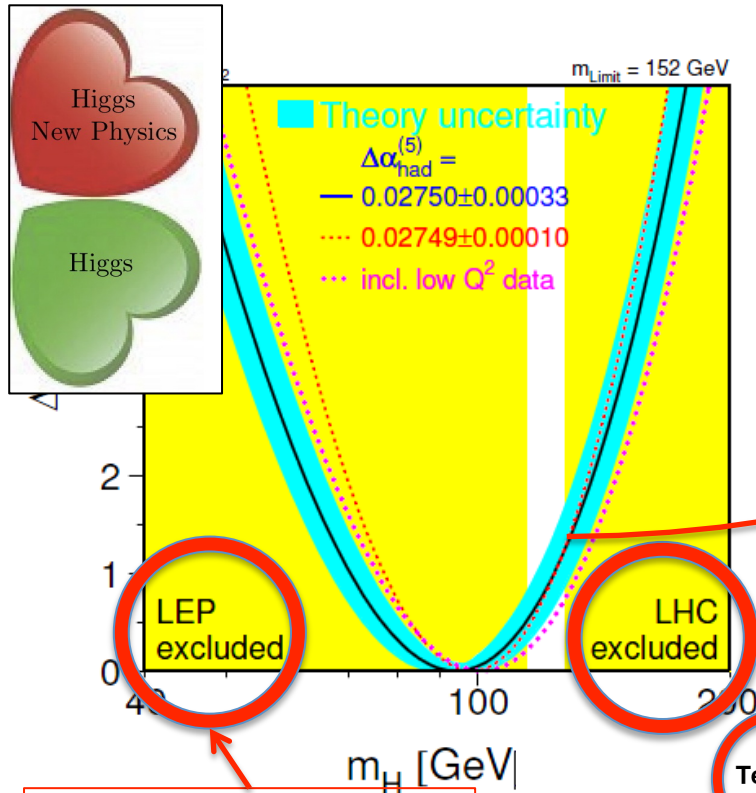
L



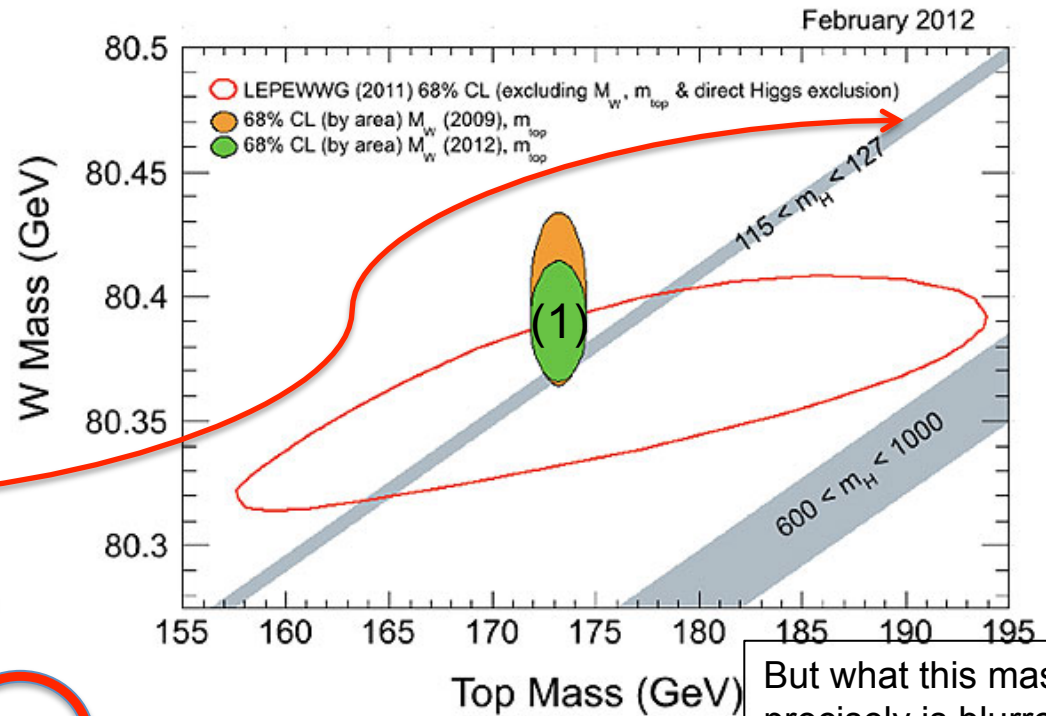
E

$\nu_e$	$\nu_\mu$	$\nu_\tau$	$W$
<i>electron neutrino</i>	<i>muon neutrino</i>	<i>tau neutrino</i>	<i>W boson</i>

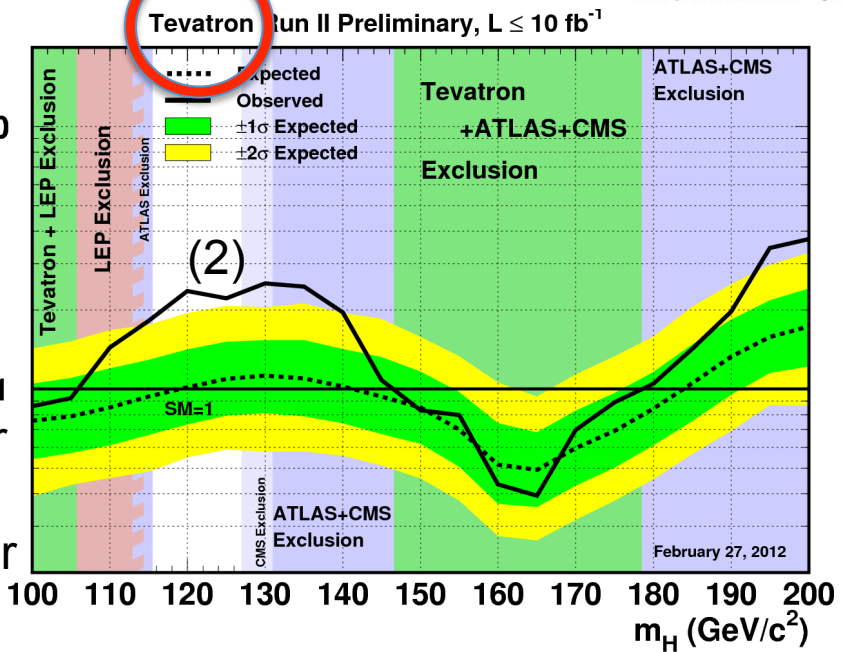




... and SLC, and numerous other experiments (BaBar, Belle ...)

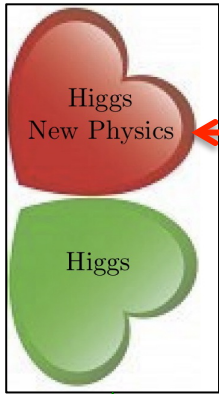


But what this mass is precisely is blurred

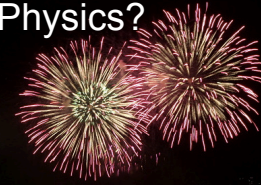


- (1) Hadron colliders are also precision machines
- (2) Colliders tend to deliver more than expected
- (3) Theorists tend to deliver more than (they) expected

# Linear Collider input to the European Strategy

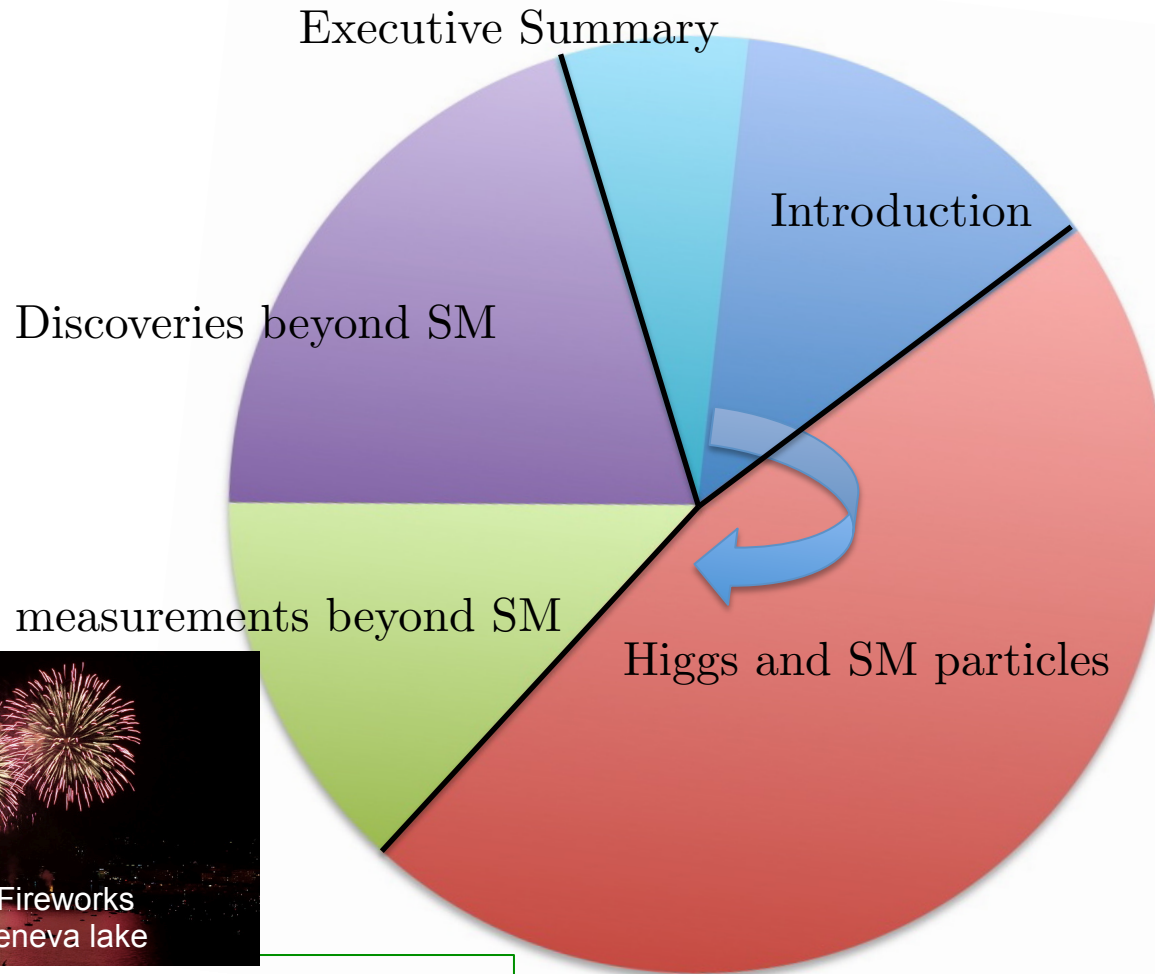


New Physics?



Huge Fireworks  
over Geneva lake

May have to await first year  
of 13 TeV data taking



Precision measurements beyond SM

Higgs?

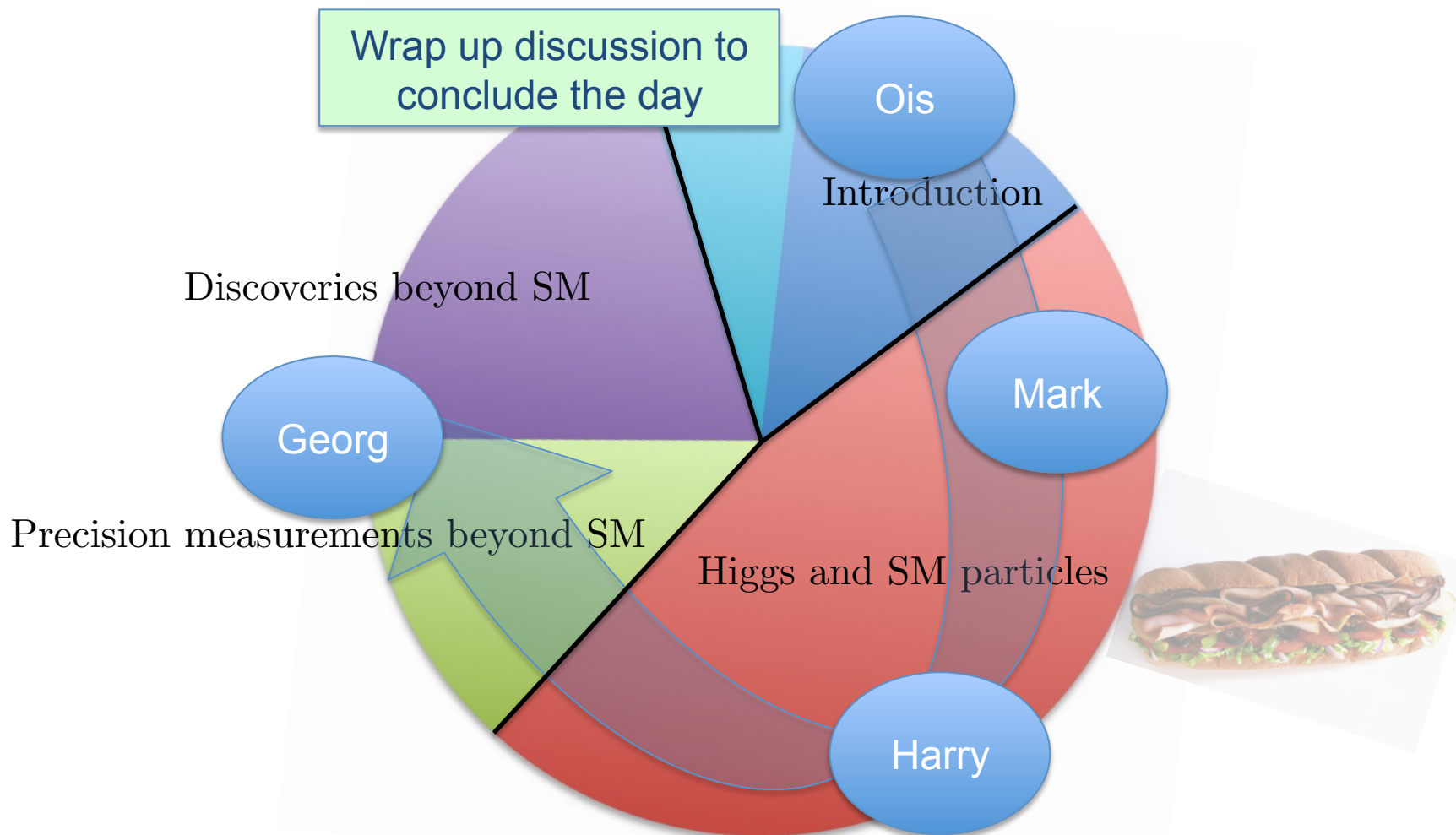


Great Fireworks  
over Geneva lake

Meaning, at least no looming exclusion by mid 2012, emphasis will obviously depend on the status of the Higgs searches.



## Linear Collider input to the European Strategy



**We tried to organize the meeting in order to cover all topics,  
But this is a town hall meeting: what matters is that  
**YOU** expressed your views on the topic Physics Case for LC**

SM is triumph of HEP in 20<sup>th</sup> century: all but EWSB experimentally confirmed  
Minimal SM = minimal EWSB : no justification for this => EWSB can be very rich  
Two LC concepts: ILC and CLIC, communities working together  
Report not concerned with comparing the technologies  
Report is about LC Physics Case with LHC having 300(0)fb<sup>-1</sup>  
Physics case studied since 20 years, and HEP priority since long  
Studies are now performed with detailed simulations of ILD & SiD  
The complementarity between LHC and LC 10 years of collaborative efforts  
When new particles found at LHC, LC is instrumental to study their properties.  
Recently boosted by LHC (&Tevatron) hints for SM-like Higgs 125GeV  
If confirmed another triumph of SM, with implications for BSM  
Will get confirmation by end of 2012 (or exclusion of SM-like Higgs)  
So far no sign for BSM, but 2015 (13 TeV) may change the picture  
In any case 2012 will mark the end of a 30 years old hunt  
LC programme has two phase LE-LC (250-500) and HE-LC(>500)  
Both need a high luminosity expressed in 10<sup>34</sup> (justify)  
Report focuses on minimal LC programme (no gigaZ, e-e-, etc.)  
Those add a lot, but are not needed to build a compelling Physics case.  
Similarly overlap of running between LHC and LC is not discussed  
Concentrate on the two phases, with 80 e- polarization (possible e+ as well)  
Interplay between hadrom and e+e- machine proved very efficient in past  
As of today stress on 125 GeV Higgs discovery at LHC  
The report is split into two main sections:

- Precision measurements of SM quantities (including 125 GeV Higgs)
- New Physics



When lunch break comes:

Many restaurants nearby, but:

**Beware of limited time !!!**

Lunch work:

what should be

- **the report**
- the format of Krakow's Open Symposium
- the date for next WWS meeting

?

