

# 2<sup>nd</sup> LHC Detector Alignment Workshop

## 25-26<sup>th</sup> June 2007

**1<sup>st</sup> LHC Detector Alignment Workshop**

4-6 September 2006  
CERN, Geneva

The aim of the workshop is to exchange ideas and information on the issues related to alignment of detectors

- Mathematical & statistical methods
- Lessons from previous & running experiments
- Alignment software framework
- Alignment plans for LHC experiments

More Information : <http://lhc-detector-alignment-workshop.web.cern.ch>

Organizing Committee :

S. Blusk	(Syracuse)
O. Buchmuller	(CERN)
A. Jacholkowski	(Catalonia)
S. Maril I Garcia	(Valencia)
T. Ruf	(CERN)
K. Safarik	(CERN)
J. Schleck	(Munich)
S. Viret	(Glasgow)

Sponsored by LCG and CERN PH department



**2<sup>nd</sup> LHC Detector Alignment Workshop**

25-26 June 2007  
CERN, Geneva

The aim of the workshop is to exchange ideas and information on the issues related to alignment of detectors

- Hardware alignment systems & combination with track based alignment
- Preparation for first data taking

More Information : <http://lhc-detector-alignment-workshop.web.cern.ch>

Organizing Committee :

F. Bauer	(Saclay)
S. Blusk	(Syracuse)
O. Buchmuller	(CERN)
A. Jacholkowski	(Catalonia)
S. Maril I Garcia	(Valencia)
C. Martinez Rivero	(Cantabria)
T. Ruf	(CERN)
K. Safarik	(CERN)
J. Schleck	(Munich)
S. Viret	(Glasgow)

Sponsored by LCG and CERN PH department

Introduction

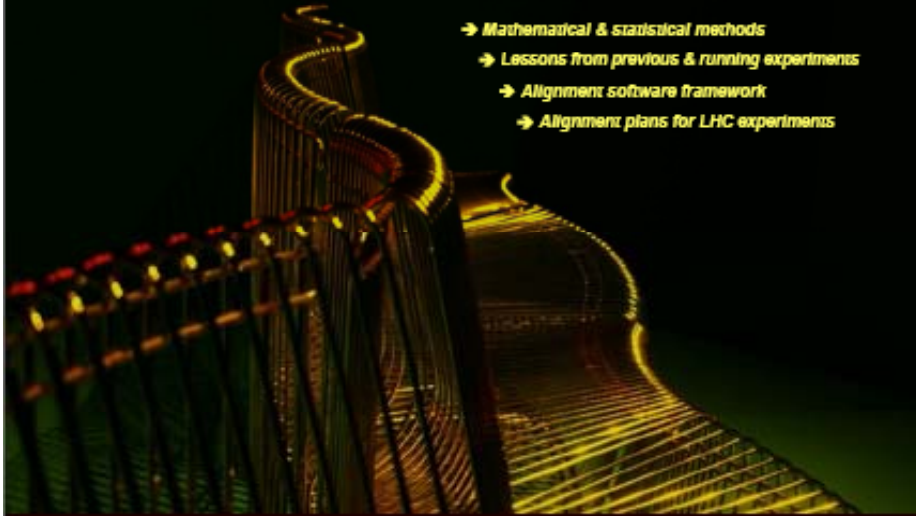
# 1<sup>st</sup> LHC Detector Alignment Workshop

4-6 September 2006  
CERN, Geneva



*The aim of the workshop is to exchange ideas and information on the issues related to alignment of detectors*

- Mathematical & statistical methods
- Lessons from previous & running experiments
- Alignment software framework
- Alignment plans for LHC experiments



More Information : <http://lhc-detector-alignment-workshop.web.cern.ch>

#### Organizing Committee :

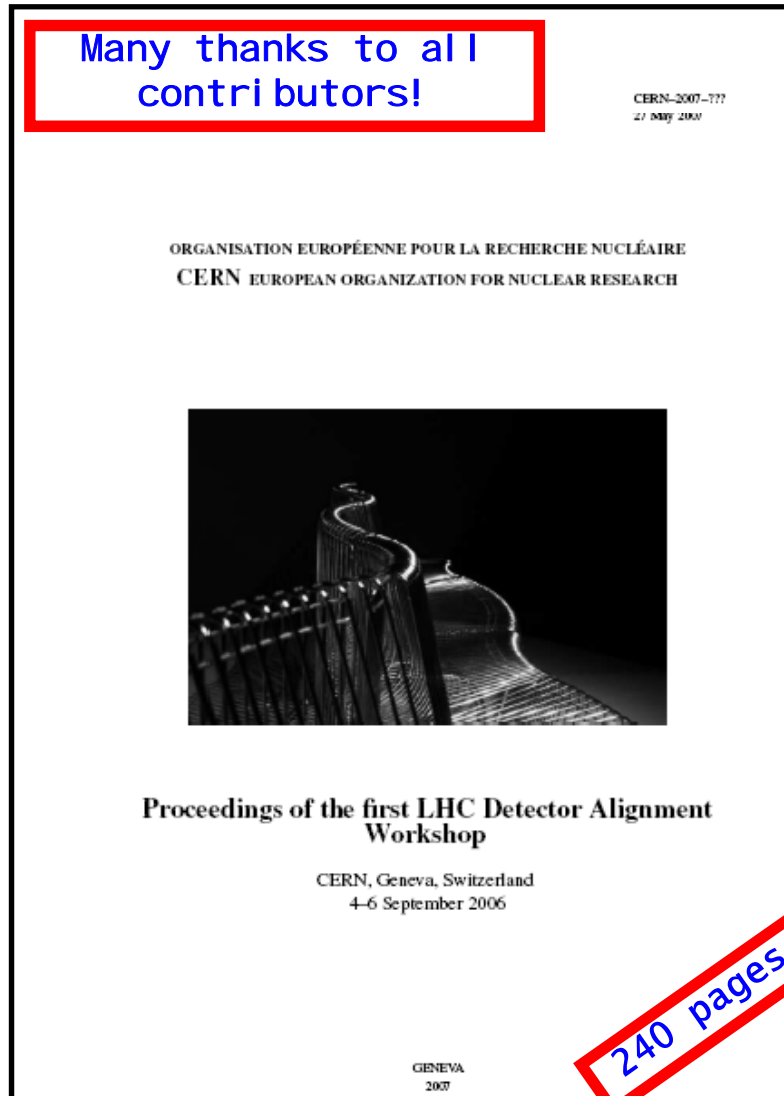
S. Blusk	(Syracuse )
O. Buchmuller	(CERN )
A. Jacholkowski	(Catania )
S. Marti i Garcia	(Valencia )
T. Ruf	(CERN )
K. Safarik	(CERN )
J. Schleck	(Munich )
S. Viret	(Glasgow )



Sponsored by LCG and CERN PH department

Outcome of the  
first Workshop

1. Outcome of the first Workshop  
2. Goals of the second Workshop



- First workshop was a success: new ideas presented, important input from running experiments, sharing of techniques between LHC experiments (see the nice [summary](#) given by D. Brown).

- This first phase is concluded by a CERN report.

- Should be printed soon (*partly sponsored by CERN SFT group*). Draft copy available at:

<http://www.physics.gla.ac.uk/~sviret/LHCalimain.pdf>

# 2<sup>nd</sup> LHC Detector Alignment Workshop

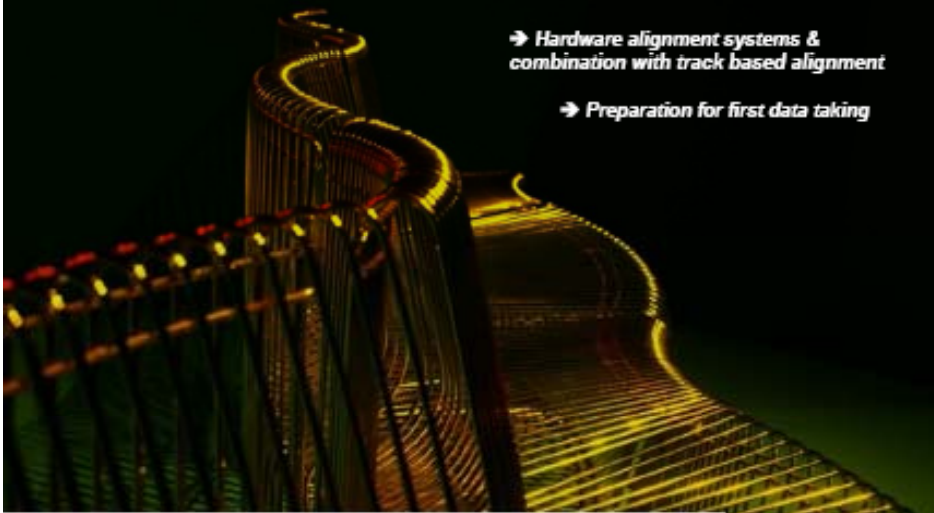
25-26 June 2007  
CERN, Geneva



*The aim of the workshop is to exchange ideas and information on the issues related to alignment of detectors*

→ Hardware alignment systems & combination with track based alignment

→ Preparation for first data taking



More Information : <http://lhc-detector-alignment-workshop.web.cern.ch>

#### Organizing Committee :

F. Bauer	(Saclay )
S. Blusk	(Syracuse )
O. Buchmuller	(CERN )
A. Jacholkowski	(Catania )
S. Marti i Garcia	(Valencia )
C. Martinez Rivero	(Cantabria )
T. Ruf	(CERN )
K. Safarik	(CERN )
J. Schieck	(Munich )
S. Virel	(Glasgow )



Sponsored by LCG and CERN PH department

Goals of the  
second Workshop

⇒ Hardware-alignment systems :

14:15->15:45 LHC session - Hardware Alignment (Convener: Florian Bauer (*DAPNIA*))

14:15 ATLAS: Hardware based muon alignment Barrel (15')	Philippe Schune
14:30 ATLAS: Hardware based muon alignment EndCap (15')	Christoph Amelung
14:45 ATLAS: Rapid precise shape monitoring of the ATLAS silicon tracker (30')	Stephen Gibson
15:15 CMS: Muon Hardware System & MTCC Experience (30')	Pablo Martinez
15:45	break

16:15->17:45 LHC session - Hardware Alignment II (Convener: Celso Martinez Rivero (*Consejo Superior de Investigaciones Cientificas (CSIC)*))

16:15 CMS: Silicon Tracker Laser Alignment System (30')	Bruno Wittmer
16:45 ALICE: Geometry Monitoring System of the ALICE Muon Spectrometer and ITS-AMS (30')	Raphael Noel Tieulent
17:15 LHCb: Laser alignment monitoring system for the RICH (30')	Antonis Papanestis

**THIS AFTERNOON**

1. Outcome of the first Workshop  
2. Goals of the second Workshop

⇒ Prepare for the first data-taking (survey and computing):

09:45	Status and plans for the startup of the LHC machine (30')	Mike Lamont
10:15	Geological movements in the Pit; alignment of the machine (30')	Christian Lasseuer
10:45	break	
11:15->13:30	<b>First alignment geometry (Survey and first data)</b> (Convener: Salvador Marti I Garcia ( <i>Instituto de Fisica Corpuscular (IFIC) UV-CSIC</i> ))	
11:15	CMS (30')	Andrei Gritsan
11:45	ALICE (30')	Andrea Dainese, Ricardo Silva
	<ul style="list-style-type: none"><li>• First Geometry (15')</li><li>• First Alignment Plans (15')</li></ul>	
12:15	LHCb (30')	Steven Blusk ( <i>Syracuse University</i> )
12:45	ATLAS (30')	Christian Schmitt
13:30	Lunch	
14:30->16:30	<b>Alignment and Computing</b> (Convener: Thomas Ruf ( <i>CERN</i> ))	
14:30	ATLAS alignment computing ID+Muon (30')	Serguei Kotov
15:00	ALICE: Alignment and computing (30')	Raffaele Grosso
15:30	CMS: Alignment work and data flow (30')	Jim Pivarski
16:00	LHCb (30')	
09:15	Geant 4 & Detector Description Model (30')	Gabriele Cosmo

THIS MORNING  
&  
TOMORROW

- 1. Outcome of the first Workshop
- 2. Goals of the second Workshop

⇒ Some news on software alignment:

## THIS MORNING

10:00->11:00 **Improvements of Algorithms** (Convener: Jochen Schieck (*Max-Planck-Institut fur Physik*))

10:00 Millepede II (30')	Volker Blobel
10:30 Application of Millepede II (30')	Markus Stoye

11:00 break

11:30->13:15 **Improvements of Algorithms II** (Convener: Jochen Schieck (*Max-Planck-Institut fur Physik*))

11:30 Alignment with tracks fitted with a Kalman filter (30')	Wouter Hulsbergen
12:00 Alignment of the ATLAS Muon Spectrometer with Curved Tracks (20')	Oliver Kortner
12:20 ATLAS InnerDetector: alignment with tracks (20')	Salvador MARTI I GARCIA

- 1. Outcome of the first Workshop
- 2. Goals of the second Workshop

⇒ And a look at the future...

**TOMORROW MORNING**

09:15 Alignment at the ILC (30')

Marcel Vos

**SEPTEMBER/OCTOBER ?**



⇒ ~~LHC upgrade & alignment~~  
**Have a good works**

