

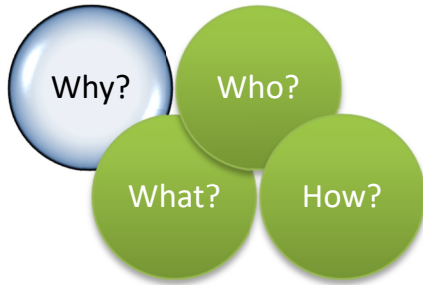


5 th workshop dedicated to MOtion ContRoL Applications in large Facilities

Brian Nutter ([DLS](#)), Yves-Marie Abiven ([SOLEIL](#)),
Nader Afshar ([Australian Synchrotron](#)),
Guifre Cuni ([ALBA](#)), Nicola Coppola ([European XFEL](#)),
Christer Engblom ([SOLEIL](#)), Nicolas Janvier ([ESRF](#)),

MOCRAF Workshop at ICALEPCS 2017

Motion control is a **key element**, which enables high level of performance at scientific facilities



4 previous MOCRAF Workshop

2011 in SOLEIL,
2012 in Diamond,
2013 ICALEPCS San Francisco,
2015 ICALEPCS Melbourne.

ICALEPCS 2017 is an ideal place for the 5th WS,
meeting new friends

MOCRAF Workshop at ICALEPCS 2017

Why?

Who?

What?

How?

cube systems

Australian Synchrotron

Centro de Estudios de Física del Cosmo...

Delta Tau Ltd

Diamond Light Source

Elettra Synchrotron Trieste

ELI-ALPS Kutatóintézet

ESRF - The European Synchrotron

European Council for Nuclear Research

European Spallation Source

European XFEL research campus Schen...

FMB Feinwerk- und Meßtechnik G

Forschungszentrum Jülich GmbH Branc...

Ganil

Gravitational Observatory - AURA

Gravitational Observatory

Gravitational Facility Research & ...

Gravitational - La...

61 attendees
14 countries
31 Institutes
5 trading companies

→ https://www.google.com/maps/d/viewer?mid=1IJHQnihWT_Sk_-aLoR_gkVmAY2g

Topics addressed



- Presentation of new facilities participating at MOCRAF 2017
- Trial of a new format; fewer presentations, more discussion
 - Motion control challenges
 - Motion Control and Sample Environment Automation
 - Technical solutions in software and in low level hardware
 - Hardware challenges
 - Experiences in motion control

Why?

Who?

What?

How?

Workshop program

Why?

Who?

Why?

How?

MOCRAF 2017					
09:00		Introduction	Diamond	Brian Nutter	
09:05	Morning session 1	short presentations (3")	Chair: Yves-Marie Abiven	speaker	Timekeeper
		1 MAXIV		Julio Lidón-Simón	Nicolas Janvier
		2 Attocube systems AG		Ida Simson	
		3 CARS University Of Chicago		Mark Rivers	
		4 Faraday motion		Andy Joslin	
		5 Science And Technology Facilities Council		Matt North	
		6 Fmb Gmbh		Jens Rekow	
		7 Observatory Science		Philip Taylor	
		8 Iranian Light Source Facility		Ali Khalilzadeh	
		9 Forschungszentrum Jülich		Harald Kleines	
		10 Scientifica International S.L.U.		Juan Reyes	
		11 LLNL		Rick Wilson	
10h		General topic			
		1 Feedback on the survey to upgrade motion controller at Australian synchrotron	Australian Synchrotron	Nadar Afshar	
10H30		Coffee			
11H	Morning Session 2	Motion control challenges	Chair: Guifre Cuni	speaker	Timekeeper
	15"	Experiences in interferometric control of piezo stages	DLS / Attocube	Brian Nutter	Nader Afshar
	15"	Advanced Monochromator Control" and "High Stability Mirror Kinematic"	fmb berlin	Rekow, Jens	
	30"	Round table & discussion			
		Motion Control and Sample Environment Automation:			
	15"	Sample Changer Development for Sample Environment. Rise of the Robots	STFC	Matt north	
	30"	Round table & discussion			
	15"	Summarize			
13H		Lunch			
14H	Afternoon session 1	Technical solutions in software and in low level hardware	Chair: Nicola Coppola	speaker	Timekeeper
	15"	Multi-Axis - Multi-Controller for in-vacuum diffractometer	SOLEIL	Christer Engblom	Brian Nutter
	15"	complex coordinated motion in EPICS	CARS	Mark Rivers	
	30"	Round table & discussion			
	15"	Summarize			
15H30		coffee			
16h	Afternoon session 2	Hardware challenges	Chair: Nader Afshar	speaker	TimeKeeper
	15"	Predictive modelling and error budgeting	SIRIUS	Gabriel Moreno/ Ricardo Caliri	Christer Engblom
	30"	Round table & discussion			
	15"	Summarize			
		Experiences in motion control			
	30"	Round table & discussion			
	15"	Summarize			

- 7 groups for round table, discussing each topic, encouraged participation
- One chair to facilitate and one reporter to summarize exchanges

Workshop summary



Studious , Dynamic and interactive day!



Studious , Dynamic and interactive day!

Workshop summary



- Short presentations by **new facilites** and **companies** enables us to know each other better
 - *Facilites now operational or updating their systems to address continuous scanning requirements*
 - *Iraninan facility presented the first prototype they have done*
 - *Companies presented briefly their field of activities*
- Overview of a survey done at the Australian synchrotron to **upgrade** their **motion control solution** was presented.
 - *trend ongoing in the community!*
 - *Choice not easy ! No perfect solution!*

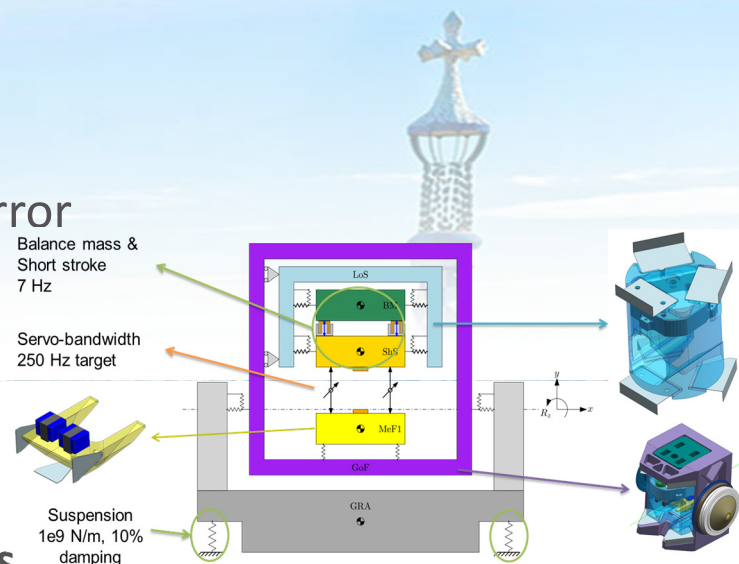
Workshop summary



- **Management of obsolescence** of motion control equipment
 - *Various strategies leading to consider new solutions after years of operation.*
- **Automation**, pushing the use of powerful controllers to control complex systems using advanced functionalities
- Multi –axis , multi-controller and requirements for **synchronization**
 - *Embedded kinematics or compensation table built in the high level software?*
 - *External software, hardware synchronisation over motion controller or dedicated electronics*
- **Methods** for qualifying mechatronic systems and nanopositioners

Workshop summary

- **Modelling systems** to identify all sources of error
 - *Requirements of physical model*
 - *Make mechanical and motion control engineer work closer together*
- Requirements to investigate **industrial robots**
 - *Facilities have experience of sample changing in cryogenic environment*
 - *Facilities are investigating this field of activity but nobody has extensive experience in collaborative robots.*



Conclusion

- New interactive format has been appreciated by attendees.
- They look forward to MOCRAF 6
- Presentations from this workshop are available via Synchrotron Soleil web site along with those from previous workshops
<https://www.synchrotron-soleil.fr/fr/evenements/motion-control-applications-large-facilities-workshop-8th-13th-october-2017-barcelona>

