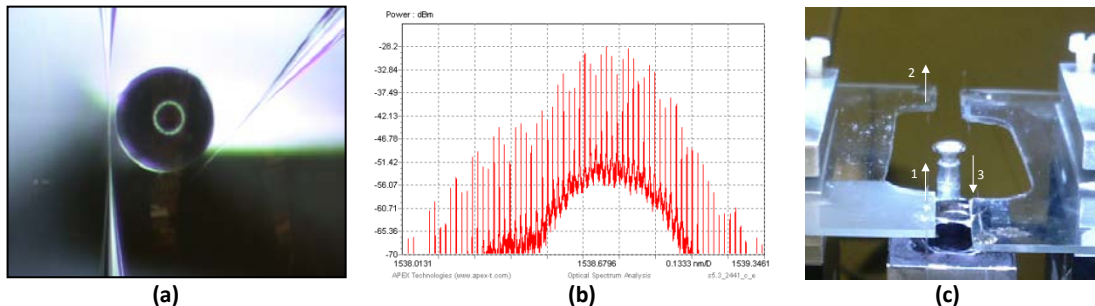


## Context

Optical frequency combs are novel sources which generate a set of regularly spaced frequencies. Initially based on laser systems operating in ultra-short (femtosecond) pulsed regime, these sources were studied first and foremost for metrological purposes with the strategic objective to generate reference frequencies of record precision and stability. This work led to the award of the 2005 Nobel Prize in Physics to its pioneers Professors T.W. Hansch et J.L. Hall. Since then, the topic has continued to be a vibrant field of research with strands devoted to the improvement of the reliability, compactness, or user-friendliness of these emitters through technological evolutions and progress and with a range of activities devoted to the demonstration of novel applications including long-distance reference frequency distribution, high-precision synchronisation of optical fibre telecommunication networks, high-purity radio-frequency generation and ultra-high resolution spectroscopy.



Figures: (a) Melted glass spherical resonator, (b) frequency comb spectrum, (c) Polished CaF<sub>2</sub> disk resonator

## Workshop Objectives

This workshop is jointly organised by the « Centres de Compétences Techniques » of the CNES (Centre National des Etudes Spatiales – National Centre for Spatial Studies) and the "Optique Traitement de l'Image" (Optics and Image Processing) network of the "Sciences et Technologies pour l'Aéronautique et l'Espace" foundation ([www.fondation-stae.net](http://www.fondation-stae.net)).

One of the objectives of this workshop is to bring together the community interested in optical frequency combs to give an overview of this field, establish the state-of-the-art and discuss the latest developments in terms of source development and characteristics but also in terms of their applications.

To that extent, tutorial talks will introduce the generation principles, practical implementations and limitations of the various types of optical frequency combs. Subsequent invited presentations will deal with the most promising applications for portable aeronautics or space applications. A poster session is also organised to give the opportunity to all the participants to present their work in the field.

This workshop will also be the occasion to learn from the experts, discuss new ideas, identify new collaborations and potentially define novel research strands.



# Optical Frequency Combs :

## From sources to applications

### Toulouse – 12/2/2014



## Targetted audience

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This workshop aims to bring together researchers, engineers, project investigators and experts interested in optical frequency comb source development and applications. More generally, this workshop is of interest to anybody interested in developing or using laser technology in portable systems for space or aeronautics applications.

## Preliminary programme

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The workshop preliminary programme is provided hereafter, although a more up-to-date version is accessible online on the Optical and Optoelectronics CCT of the CNES website whose address is <https://cct.cnes.fr/content/optical-frequency-combs-sources-applications>.

09:00-09:20	Official Opening presentation
09:20-10:00	Talk 1 : Y. Le Coq – Syrte -
10:00-10:40	Talk 2 : A. Ramdane – LPN – "Frequency comb generation using InAs/InP Quantum Dash based mode locked lasers and applications"
10:40-11:00	Coffee/Tea Break
11:00-11:40	Talk 3 : T. Herr – EPFL - "Microresonator frequency combs"
11:40-12:20	Talk 4 : C. Chardonnet – LPL -
12:20-13:30	Lunch
13:30-15:00	Poster session
15:00-15:40	Talk 5 : N. Picqué – ISMO -
15:40-16:20	Talk 6 : T. Udem – Max Planck Institute – "Frequency Combs for Astronomy"
16:20-17:00	Talk 7 : M. Alouini – Univ. Rennes – "Down-conversion and phase-locking of mm-wave and THz beatnotes through optoelectronic interleaved comb generation"
17:00-17:20	Closing remarks

## Registration and Practical Informations

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The workshop will be held on Wednesday **12<sup>th</sup> February 2014** at the **Institut Aéronautique et Spatial** (IAS), 23 avenue Edouard Belin à Toulouse (France).

**Anyone with an interest in optical frequency combs is welcome to attend and submit a poster contribution to the workshop.** The registration to this workshop (and lunch) is free but compulsory. Registration is already open on the CNES CCT website <https://cct.cnes.fr/content/optical-frequency-combs-sources-applications> and will close on the 06/02/2014. Early registration is advised as the number of participants will be limited.

**All the participants are invited to contribute to the workshop with a one-page (A4) abstract** which should be emailed to [freqcomb@laas.fr](mailto:freqcomb@laas.fr) and copied to [scalvez@laas.fr](mailto:scalvez@laas.fr) by the **31/01/2014**.

## Calendar

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- 06/12/2013** First announcement of the workshop
- 31/01/2014** Deadline for abstract submission
- 06/02/2014** Deadline for the workshop registration
- 12/02/2014** Workshop



# Optical Frequency Combs :

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## Scientific Committee

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T. Böhm (IRAP)  
S. Calvez (LAAS-CNRS)  
B. Cugny (CNES)  
A. Gauguet (IRSAMC)  
T. Lévêque (CNES)  
O. Llopis (LAAS-CNRS)  
F. Lozes (LAAS-CNRS)