

# RADSAGA INITIAL WORKSHOP

## CERN 19-23 March 2018

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RADSAGA Coordination Team, CERN – 19.03.2018

*RADIation and Reliability Challenges for Electronics used in Space, Aviation, Ground and Accelerators (RADSAGA) is a project funded by the European Commission under the Horizon2020 Framework Programme under the Grant Agreement 721624. RADSAGA began in Mars 2017 and will run for 4 years.*



**Welcome!**

Project Coordinator: R. Garcia Alia  
Deputy Coordinator: A. Javanainen  
Training and Outreach officer: P. Leroux

Senior HR Administrator: C. Granier  
Network Officer: S. Allegretti  
Finance Officer: M. Traud  
Legal Officer: L. Pocha

- I. The agenda
- II. A few logistic details on the workshop
- III. The CROC competition



- ❑ 19.03 - Communicating to all public, science writing, outreach  
@ 19h Dinner – Restaurant 1
- ❑ 20.03 - Knowledge Transfer, Intellectual Properties, Patent search
- ❑ 21-23.03 - Technical seminars and Laboratory Visit
- ❑ 23.03 -Special Event
  - @ 15h40 Guideline for preparation of the Mid-Term Review Meeting
  - @ 16h10 CROC competition



- ❑ Making progress in the methodologies applied to the design & qualification of electronic components and systems to reliably operate in a radiation environment (space, accelerators, ground-level)
- ❑ Due to our increased dependence on reliable and performant electronics and their enhanced sensitivity to radiation, RADSAGA aims at having a beneficial impact on society delivering reliable and efficient solutions for medical, transport, computing, scientific research, etc.
- ❑ The challenge is approached in a multi-disciplinary manner: radiation effects and environment modelling, understanding of the basic mechanisms responsible for radiation damage, radiation hardening by design techniques, test facility & qualification approaches, design of COTS based systems for increased radiation tolerance...

The technical program of the RADSAGA training events aims at covering part of the points mentioned above.



- ❑ **Wednesday morning**
  - ✓ Guidelines and standards for micro-electronic component reliability, *Mauro Pipponzi and Stefano Petrucci (INTEL inc.)*
- ❑ **Wednesday afternoon**
  - ✓ Introduction to Radiation Protection, *Pierre Carbonnez (CERN)*
- ❑ **Thursday morning & afternoon**
  - ✓ Radiation Test Standards for Space, *Francoise Bezerra (CNES)*
- ❑ **Friday morning**
  - ✓ Space Weather and the variable radiation environment in space, *Dr. Gerhard Drolshagen (Oldenburg University)*
- ❑ **Friday morning and afternoon**
  - ✓ Industrial Experience in Radiation Engineering, *Aminata Carvalho (AIRBUS)*

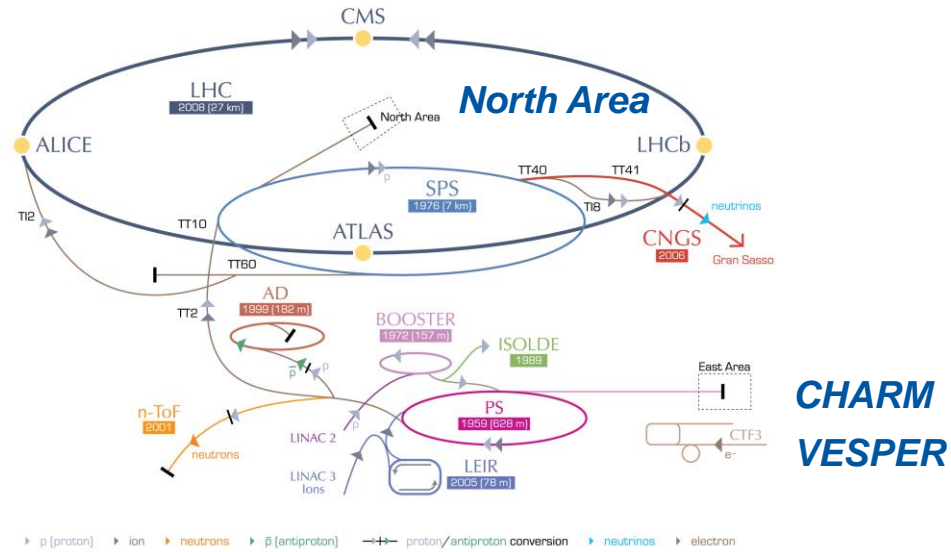
## A few logistic details

- ❑ **For the Knowledge Transfer workshop on 20.03**
  - ✓ Bring your personal laptop or tablet
  - ✓ Prepare keywords related to your research to be used in literature and patent search
  
- ❑ **Facility visits**
  - ✓ Broad variety of CERN facilities and experiments
  - ✓ Bring always your dosimeter to avoid to forget it!
  - ✓ Vanessa Wyrwoll, Matteo Cecchetto & the facility experts will be your guides
  
- ❑ **A RADSAGA ESRs representative to the Supervisory Board is needed (deadline end of March 2018)**

# Overview of CERN accelerator complex



## CERN's accelerator complex



- LHC Large Hadron Collider    SPS Super Proton Synchrotron    PS Proton Synchrotron
- AD Antiproton Decelerator    CTF3 Clic Test Facility    CNGS Cern Neutrinos to Gran Sasso    ISOLDE Isotope Separator OnLine DEvice
- LEIR Low Energy Ion Ring    LINAC LINear ACcelerator    n-ToF Neutrons Time Of Flight







## SynchroCyclotron SC in Meyrin

- ❑ The first CERN accelerator proposed by Enrico Fermi, provided beam for particle and nuclear physics
- ❑ The first pion decay was observed here

➤ ***No dosimeters needed!***





## CHARM facility

- ❑ Cern High energy Accelerator Mixed field/facility
- ❑ A unique facility for testing components and systems in a mixed radiation field representative not only of the high-energy accelerator environment, but depending on the versatile configuration, also of other applications such as ground level and space

## VESPER facility

- ❑ The Very energetic Electron facility for Space Planetary Exploration missions in harsh Radiative environments
- ❑ High energy electron beamline for radiation testing which is part of the CLEAR experimental linear electron accelerator at CERN and is so far mainly used for research activities related to the ESA JUICE mission, to explore the Jovian environment

➤ ***Dosimeters mandatory!***

# Logistics: Laboratory visit on Thursday 22.03

## SPS North Area in Preveessin

- ❑ The North Area beams are produced by a high-intensity primary proton or ion beam extracted from the SPS accelerator
- ❑ The highly energetic ion beam was recently used at CERN for radiation testing purposes, mimicking Galactic Cosmic Rays and mainly focusing on space applications
  - ***Dosimeters mandatory!***

## SM18 between Meyrin and Preveessin

- ❑ LHC magnets and instrumentation test facility
- ❑ Cryogenic tests down to 1.9 K
- ❑ Current, vacuum, pressure tests
  - ***No dosimeters needed!***





# Having problems @CERN: who can I contact?



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## Why CROC?

Propose a **RADSAGA animation movie** to present the goals, challenges and benefits to a broader community.

**What to do?** Submit an A4 page describing :

- Either an original **scenario and implementation plan** for such a movie
- Either an **original idea and implementation plan** to reach out to society at large and especially to youngsters.

## What else?

- On Friday 23.03 the **RADSAGA outreach board** and will review the work and announce the winner!
- The **best submission wins a tablet**. In case of **joint submissions** the prize will increase!

**You have still 3 days to propose and win (deadline midnight of 21.03)!**



*Thank you for your attention  
and enjoy the workshop!*