

The RADSAGA Project from the Origin to its Future

17-19 May, 2021

RADSAGA Final Conference and Industrial event

<https://indico.cern.ch/event/983095/>

Markus Brugger and Rubén García Alía

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 Program under the Grant Agreement 721624.

RADSAGA began in Mars 2017 and will run for 5 years.

Innovative Training Networks (ITN)
Call: H2020-MSCA-ITN-2016

“RADSAGA”

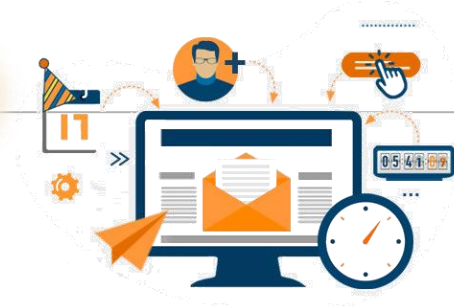
“**RADI**ation and **RELI**ability Challenges for Electronics used
in **S**pace, **AV**ionics, on the **G**round and at **AC**celerators”



This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie-Sklodowska-Curie grant agreement number 721624.

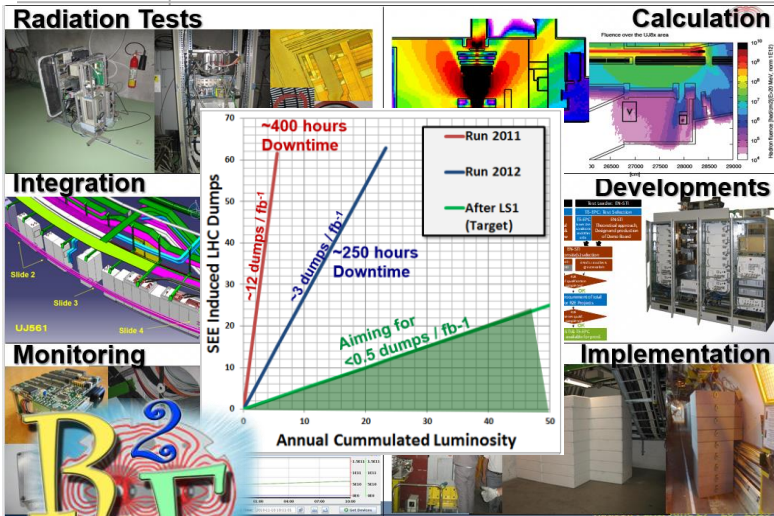


Key Ingredients



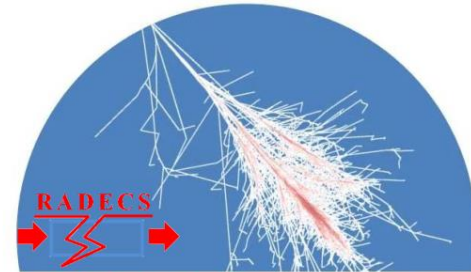
- ❑ Idea
- ❑ The Right People/Team
- ❑ (many) Emails, Discussions, Meetings, Phone Calls
- ❑ A Cool Name & A Website **RAD.....**
- ❑ A Sound Document/Structure & Easy Graphs
- ❑ Flexibility, Time & Patience
- ❑ A Bit of Luck
- ❑ Coffee, Lunch, Dinner, Beer, Wine
- ❑ ... and ... eventually ... a Logo





R2E

2010+
The **R2E** Crisis
@ CERN



RADSOL 2011

Electronique et rayonnements
naturels au niveau du sol

*Journées nationales – 4^{ème} édition- consacrées
aux méthodologies de conception, de
qualification et de validation des systèmes
électroniques*

CNRS, Campus Gérard Mégie, Paris
14-15 juin 2011

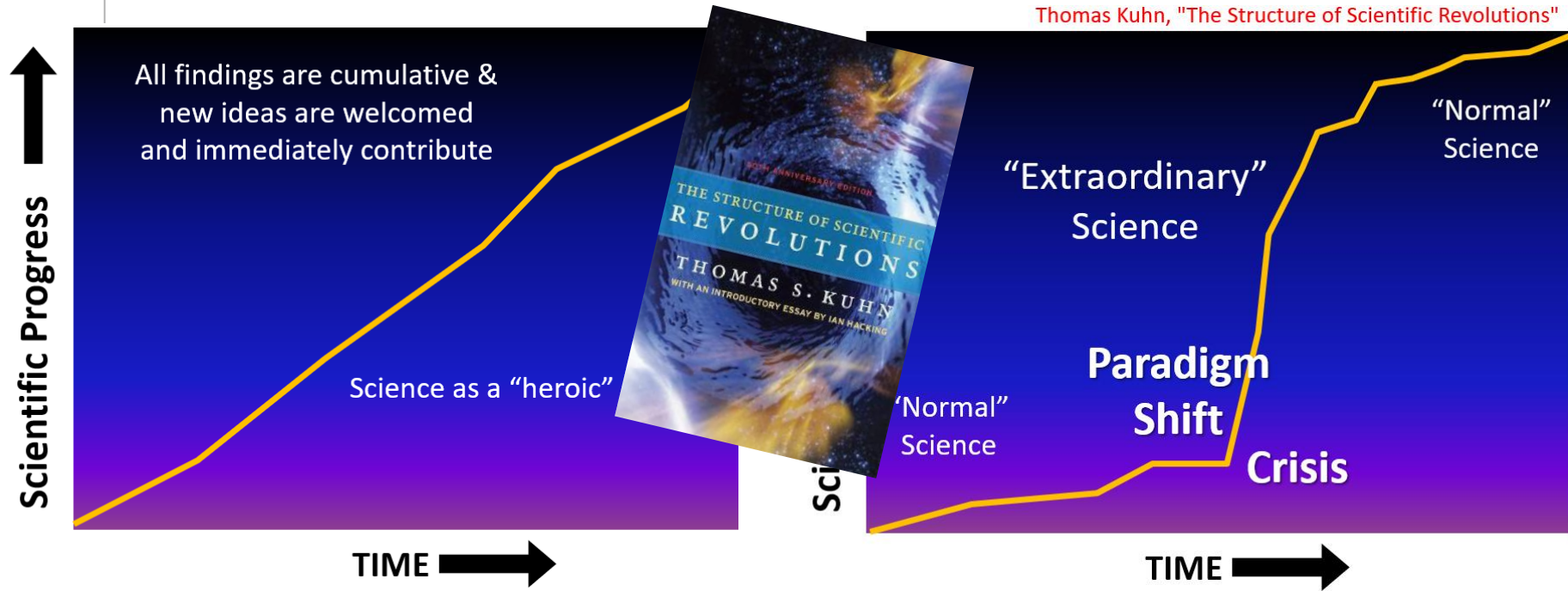
<http://www.ies.univ-montp2.fr/radsol2011/>

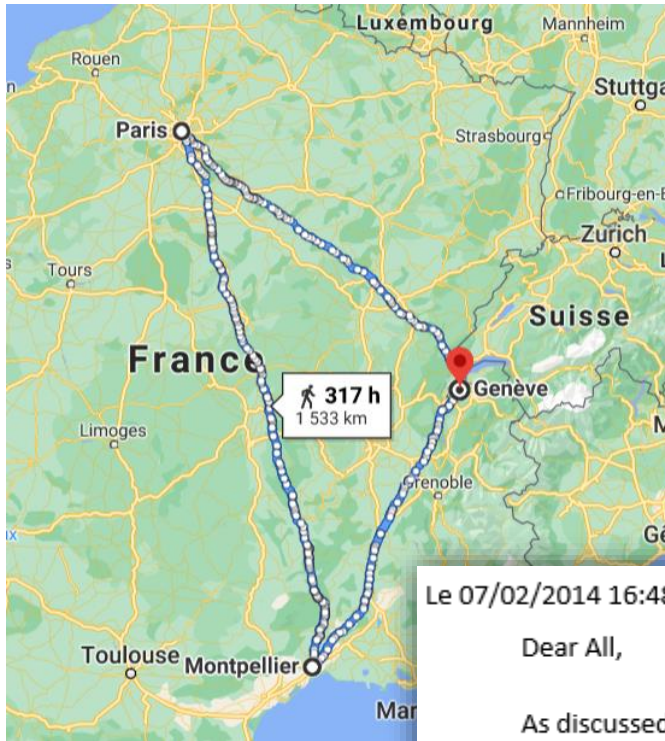
- An encounter
@MC2010
- FLUKA
- -> **FUNSTAFF**
- & the Beginning of
an Extraordinary
Collaboration

- MC2010 -> **RadSol**
2011 to talk about
FLUKA

How It All Started – The Context -> Idea

Progress by Crisis and Paradigm Shifts (R. Baumann, RADECS 2017)





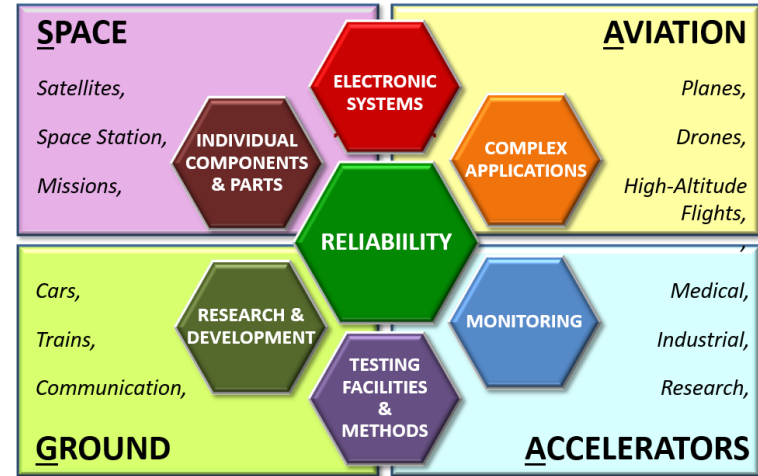
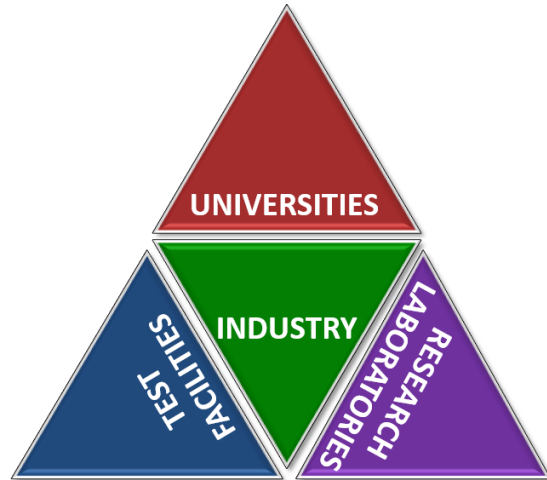
Le 07/02/2014 16:48, Markus Brugger a écrit :

Dear All,

As discussed the other day in Montpellier, please find attached a first draft proposal for the ITN idea aiming independently for a common MoU to be set-up for the exploitation of CHARM.

How It All Started – The Context -> Idea

Advance/Innovate/Develop



Involve Students


Foster Collaboration



- Marie Skłodowska-Curie actions (**MSCA**) **provide grants** for all stages of researchers' careers (doctoral candidates or highly experienced researchers) - and **encourage transnational, intersectoral and interdisciplinary mobility**.
- MSCA is part of **Horizon 2020**, the EU framework programme for research and innovation
- Objective: “The **Innovative Training Networks (ITN)** aim to **train a new generation of creative, entrepreneurial and innovative early-stage researchers**, able to face current and future challenges and to convert knowledge and ideas into products and services for economic and social benefit.”

RE: TheRadSafeSaga.docx



Markus Brugger

To  Frédéric Saigné

Cc  frederic wrobel;  Antoine Touboul



31/03/2014

On peut essayer Septembre (pour 'projet'), si non c'est Marie-Curie (Janvier 2015)

A+

Markus

-----Original Message-----

From: Frédéric Saigné [<mailto:frederic.saigne@ies.univ-montp2.fr>]

Sent: Monday, March 31, 2014 2:51 PM

To: Markus Brugger

Cc: frederic wrobel; Antoine Touboul

Subject: Re: TheRadSafeSaga.docx

c'est parti

How It All Started – A Better Name



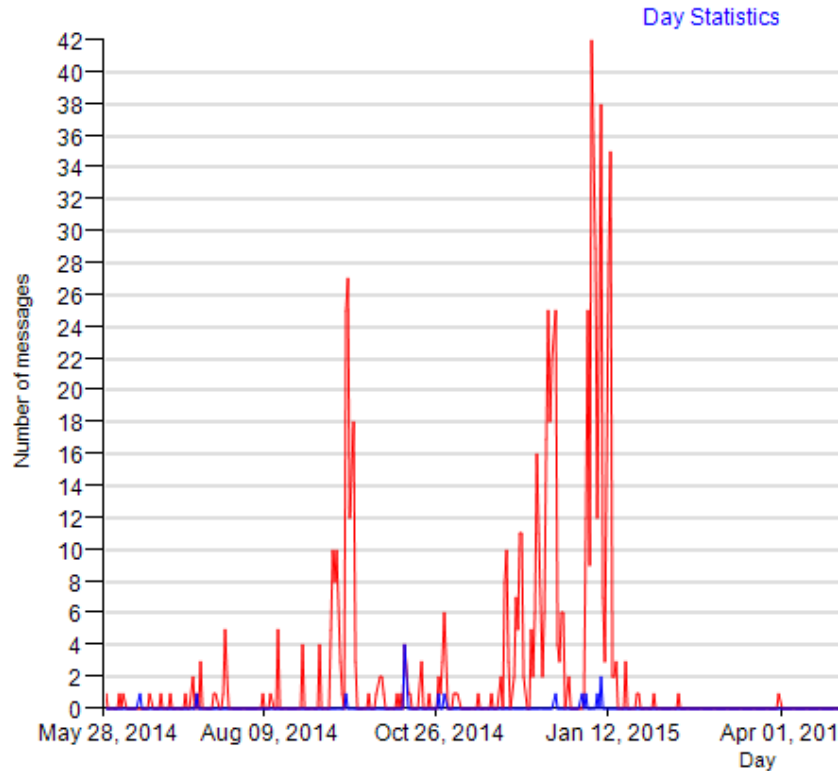
The RADSAGA Innovative Training Network



“My” Objective



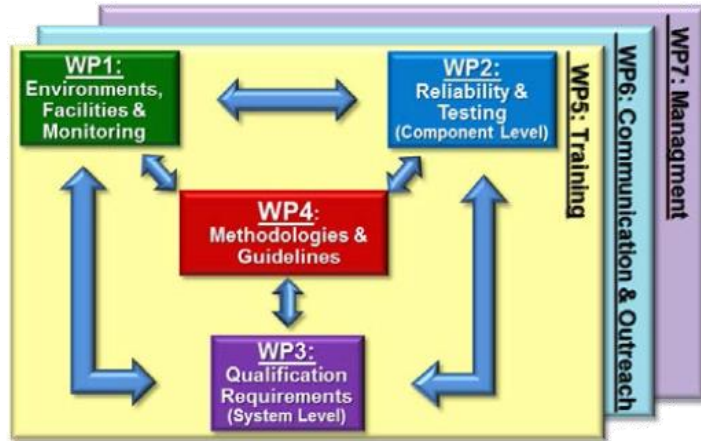
- @ 1 months ‘brain storming’
- @ Beginning of October putting it together
- @ External review (Consultant?)
- @ December: implementation of final comments
- @ What (Who) is not done before xMas,
-> will not be done!



Email address	% of Emails
ruben.garcia.alia@cern.ch	18.1
Paul.Leroux@kuleuven.be	13.5
frederic.saigne@ies.univ-montp2.fr	11.9

ITN EC Rules

- Worry in Autumn
- Work over XMas**
- Submit in January



The first trial was close, but...



- ❑ **2015 result: 93.80%**
(threshold was just a little higher)
- ❑ **The feedback was not so clear.**
 - ❑ Excellence: ? Beyond state of the art ?
 - ❑ Impact: Exploitation/IP too generic
- ❑ **But with Ruben we decided to try again!**
(he didn't yet know what was waiting for him)

Europa / Research / Participant Portal notification

Dear Coordinator,

We regret to inform you that your above proposal has been rejected. The Rejection Letter is available on the proposal page at the Participant Portal. Log on at the Participant Portal, go to My Area > My Proposal(s) and click the Follow-up (FO) button.

Regards,
Participant Portal Grant Management Service

Please do not reply to this message

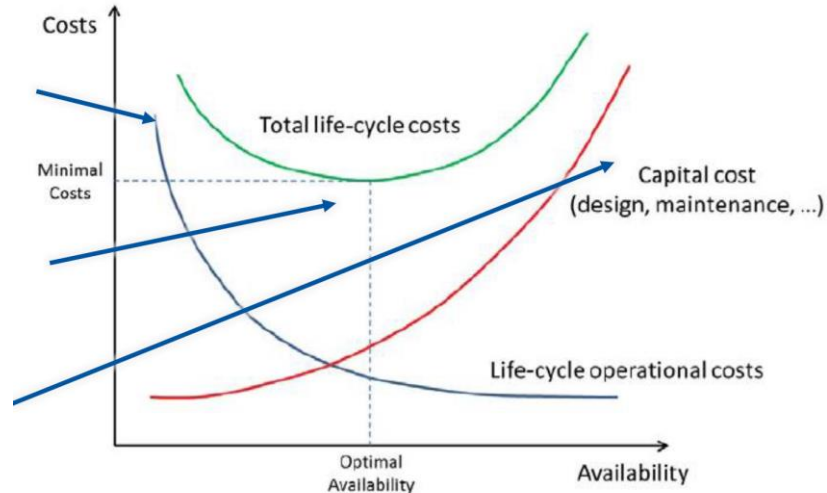
I never make the same mistake twice. I make it like five or six times, you know, just to be sure.



- Non-qualified COTS systems
- No radiation level criterion
- *(standard ground-level applications)*

- COTS components for rad-tolerant system designs
- Rad-hard by design for critical components
- Qualification at system level, radiation environment analysis
- *(RADSAGA objective)*

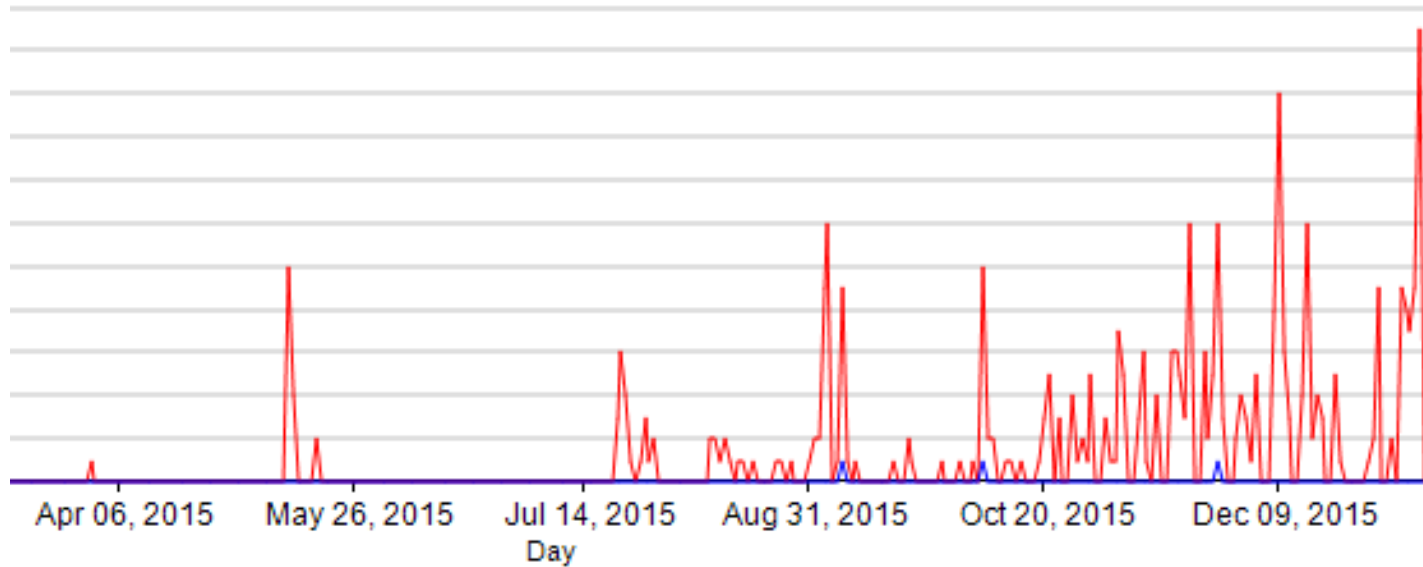
- Rad hard-components
- Heavy ion qualification at components level
- *(space, military)*



*Institute of Machine Components, University of Stuttgart
Reliability Training Course*



Certain things don't Change...





Frédéric Ruben Antoine
Ketil Julien Fréd Paul Rémi Chris
Renaud Ari Pierre Pascal Steffen
Ali Marco Marta Florent Vincent
Jean-Luc Sytze Robert Etc...
Veronique Sylvain Sebastien
Wojtek Alexander Alessandro



A Special Thought



The Beneficiaries



Coordinator, WP4 & WP7 leader, 2 ESRs



1 ESR



WP1 leader, 2 ESRs



WP5 & WP6 leader, 4 ESRs



WP2 leader, 4 ESRs



WP3 leader, 1 ESR



1 ESR

The Partners

Facilities & Research Institutes



Universities



UNIVERSITÀ
DEGLI STUDI
DI PADOVA



UPPSALA UNIVERSITET



LABORATOIRE
HUBERT CURIEN
UMR • CNRS • 5516 • SAINT-ETIENNE

Companies





4 Months of Waiting ... And



From: European Commission [<mailto:EC-NO-REPLY-GRANT-M>]
Sent: 02 May 2016 13:21
To: Markus Brugger <Markus.Brugger@cern.ch>; Salvatore D
Garcia Tello <pablo.garcia.tello@cern.ch>; Ruben Garcia Alia
<Seamus.Hegarty@cern.ch>; Marco Silari <Marco.Silari@cern.ch>
Subject: Your EU project 721624 - RADSAGA; Declaration of H
Importance: High

Europa / Research / Participant notification

Dear Legal Signatory,

The Declaration of Honour required for the Grant Agreement for the above project is available for your signature. Please sign it online. Log on to the Participant Portal, go to My Area > My Projects > click the Manage Project (MP) button.

Regards,
Participant Portal Grant Management Service

From: Sytze Brandenburg <brandenburg@kvi.nl>
Sent: 02 May 2016 14:04
To: Ruben Garcia Alia <ruben.garcia.alia@cern.ch>; Markus Brugger <Markus.Brugger@cern.ch>
Subject: RADSAGA

Dear Ruben and Markus,

We just received by email the information that RADSAGA has been approved. **First of all congratulations to both of you for the success of the proposal, which is essentially your work!**

In another email we were informed that still some additional information has to be provided. Will you let us know what we should still do or will you complete the forms on the basis of information we provide to you?

Best regards and looking forward to a fruitful collaboration in the coming years!

Sytze

--

prof. dr. Sytze Brandenburg

group leader accelerator and radiation physics

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the Netherlands

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+31503632573 (office)
fax +31503634003
Email brandenburg@kvi.nl

Time & Patience Pays Off

- ❑ Start of preparation: July 2014 aiming of 15 x 3 year ESRs
- ❑ Submitted in January 2015 and January 2016
- ❑ 2015 result: 93.80% (already very close)
- ❑ Resubmitted in 2016 (general success rate in 2016: 7% for ITNs)
- ❑ **2016 score was 96.40% → accepted!**
- ❑ 25 proposals funded - **RADSAGA ranked 5th**
- ❑ only CERN proposal that was accepted in 2016
- ❑ December 2015 -> trip to Brussels
- ❑ **Starting date: 1st of March, 2017**
- ❑ **Kick-Off meeting: 27th April, 2017**
- ❑ **Initial training event: 29th September – 6th October @RADECS**

In Other Words

- ❑ **R**evolution
- ❑ **A**wareness
- ❑ **D**reaming Together
- ❑ **S**ynthesis (or: how to spend xMas)
- ❑ **A**.... Lot of ... (or: some 2500 emails later)
- ❑ **G**ranting (or *GGG*)
- ❑ **A** Start Of A Wonderful Journey



The Work Begins – not only with the Logo

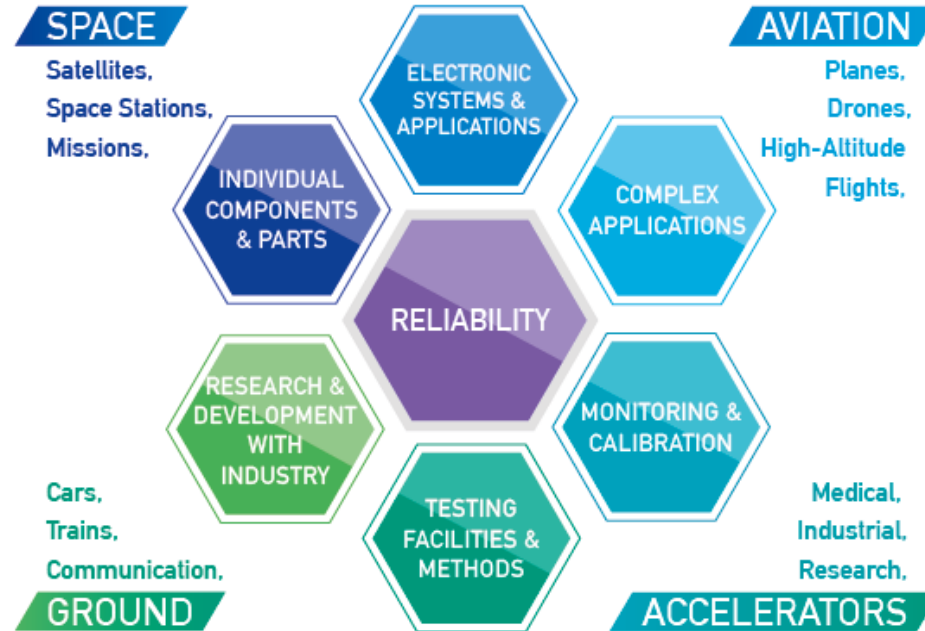


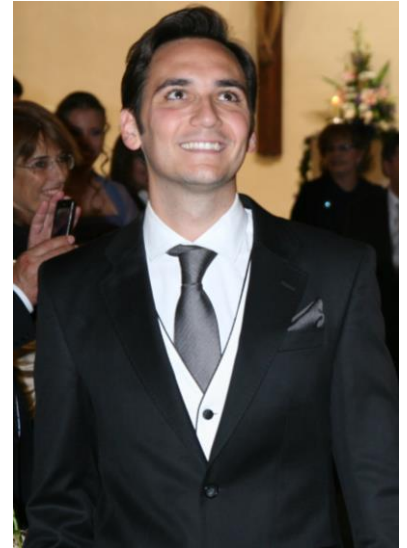
The Work Begins – The Students

- ESR1 (University of Jyväskylä): **Correlation of direct ionisation effects from low-E protons to energetic heavy ions**
- ESR2 (University of Jyväskylä): **Dosimetry methodologies in the context of environmental radiation**
- ESR3 (University of Jyväskylä): **Emerging power electronics in an energy storage system**
- ESR4 (CEA): **Challenges and innovations in radiation hardened electronics**
- ESR5 (KU Leuven): **Integrated Time-based Signal Processing Circuits for Harsh Radiation Environments**
- ESR6 (KU Leuven): **Integrated Time-based Signal Processing Circuits for Harsh Radiation Environments**
- ESR7 (University of Montpellier): **Coupled radiation effects on emerging power electronics**
- ESR8 (KU Leuven): **Integrated Time-based Signal Processing Circuits for Harsh Radiation Environments**
- ESR9 (University of Montpellier): **Hardening Electronics for Harsh Radiation Environments**
- ESR10 (University of Montpellier): **Hardening Electronics for Harsh Radiation Environments**
- ESR11 (KU Leuven): **Integrated Time-based Signal Processing Circuits for Harsh Radiation Environments**
- ESR12 (3DPlus): **System-In-Package (SiP) radiation qualification requirements**
- ESR13 (University of Montpellier): **Bridging methodology from component to system-level for the assessment of coupled radiation and degradation constraints in digital systems**
- ESR14 (University of Erlangen): **Radiation tolerant communication links to be used for distributed systems and mixed-field radiation environments**
- ESR15 (CERN): **Relevance, Guidelines & Tools for rad-hard design and radiation testing of components and systems in complex environments**

Kicking-Off & Handing Over









RADSAGA KICK-OFF MEETING

27 April 2017
CERN
Europe/Zurich

Welcom
Agenda
Registr
Particip
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My C
Present
Social E
Practical Information

DEADLINE FOR REGISTRATION : Monday 20th March 2017

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y of the
s will be

Thank You

Arabic: اركش
Burmese: ကံဆဟံမိဒါ
Cebuano: Maramhaon
Dutch: Dank u
English: Thank You
Finnish: Kiitos
French: Merci
German: Danke
Greek: Ευχαριστώ
Hawaiian: Mahalo
Hebrew: תודה
Hindi: धन्यवाद
Indonesian: Terima Kasih
Italian: Grazie
Japanese: ありがとう
Korean: 감사합니다
Latin: Gratias Agere
Mandarin: 谢谢
Malay: Terima Kasih
Malayalam: നന്ദി
Marathi: धन्यवाद
Mauritian: Mersi
Norwegian: Takk
Persian: تشکر
Polish: Dziękuję
Portuguese: Obrigado
Punjabi: ਧੰਨਵਾਦ
Romanian: Mulțumesc
Russian: Спасибо
Sanskrit: धन्यवाद
Serbian: Hvala
Sinhalese: ආචාර්යයා
Slovak: Ďakujem
Slovenian: Hvala
Spanish: Gracias
Swahili: Asante
Tamil: நன்றி
Telugu: ధన్యవాదం
Thai: ขอบคุณ
Turkish: Teşekkürler
Vietnamese: cảm ơn bạn
Welsh: Di Ogi Mersi
Yiddish: דאַנקן
Zulu: Makhulu