



An ITN in practice

Dr Ricardo Torres
oPAC Project Manager



oPAC – Optimization of Particle Accelerators

Duration	4 years (1 Dec 2011 – 30 Nov 2015)
Budget	6 M€
Fellows	22 + 1 ESRs
Partners	35 Research Centres, Universities and Companies



Beneficiary Partners



University of Liverpool, *UK*



ALBA – CELLS, *Spain*



CERN, *Switzerland*



Cividec, *Austria*



Cosylab, *Slovenia*



CST, *Germany*



European Spallation Source, *Sweden*



GSI, *Germany*



Instrumentation Technologies, *Slovenia*



Royal Holloway University of London, *UK*



Soleil, *France*



Universidad de Sevilla / Centro Nacional de Aceleradores, *Spain*

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Associate Partners



Bergoz Instrumentation, *France*



DDL – Diamond Detectors Ltd., *UK*



Institute for Storage Ring Facilities, *Denmark*



Oxford Instruments, *UK*



RHP Technology, *Austria*



Solaris – Polish Light Source, *Poland*



Stockholm University, *Sweden*



Thermo Fisher, *USA*



TMD Technologies Ltd., *UK*



Technical University of Darmstadt, *Germany*



University of Maryland, *USA*

Adjunct Partners



CIEMAT, *Spain*



CMAM – Centre for Microanalysis of Materials, *Spain*



Forschungszentrum Jülich, *Germany*



INFN – Laboratori Nazionali del Sud, *Italy*



Institutul National pentru Fizica si Inginerie Nucleara Horia Hulubei, *Romania*



SLAC National Accelerator Laboratory, *USA*



ViALUX, *Germany*



Università di Bologna, *Italy*



University of Dundee, *UK*



University of Manchester, *UK*



University of Sussex, *UK*



Uppsala University, *Sweden*

Work Packages

- WP1 – Project Management
- WP2 – Beam Physics 9 fellows
- WP3 – Beam Instrumentation 9 fellows
- WP4 – Simulation Tools 2 fellows
- WP5 – Control and Data Acquisition Systems 2 fellows
- WP6 – Training
- WP7 – Dissemination and Outreach

Management

Kick off meeting:

Liverpool, UK 8 – 10 February 2012

Mid-Term Review Meeting:

Barcelona, Spain 14 October 2014

Steering Committee Meetings:

Liverpool, UK 11 July 2012
 Brussels, Belgium 10 December 2012
 Geneva, Switzerland 26 June 2013
 Barcelona, Spain 14 October 2013
 Egham, UK 10 July 2014
 Lund, Sweden 12 December 2014
 Liverpool, UK 26 June 2015
 Seville, Spain 8 October 2015



Management

Kick off meeting:

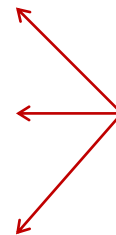
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Mid-Term Review Meeting:

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Steering Committee Meetings:

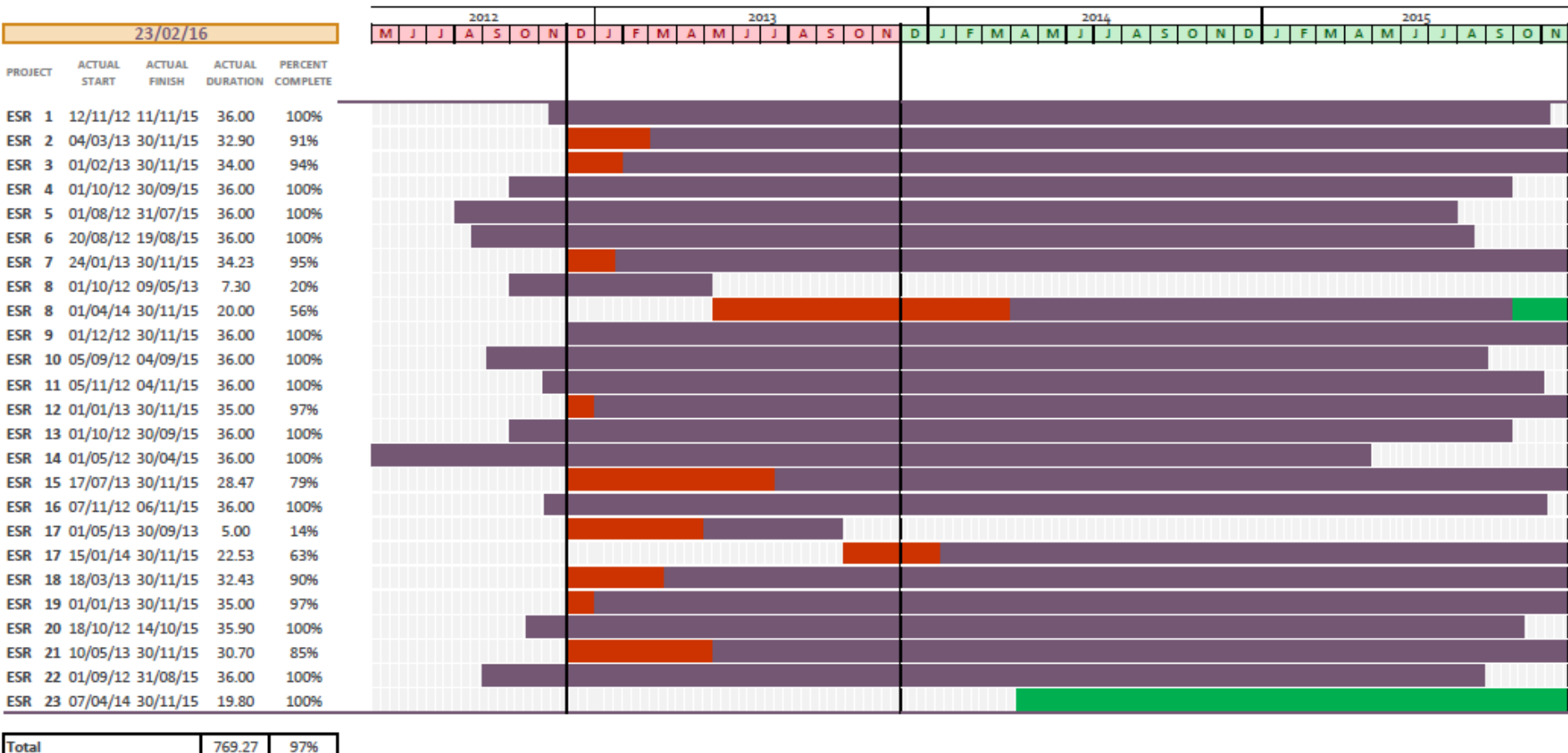
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Supervisory Board Meetings

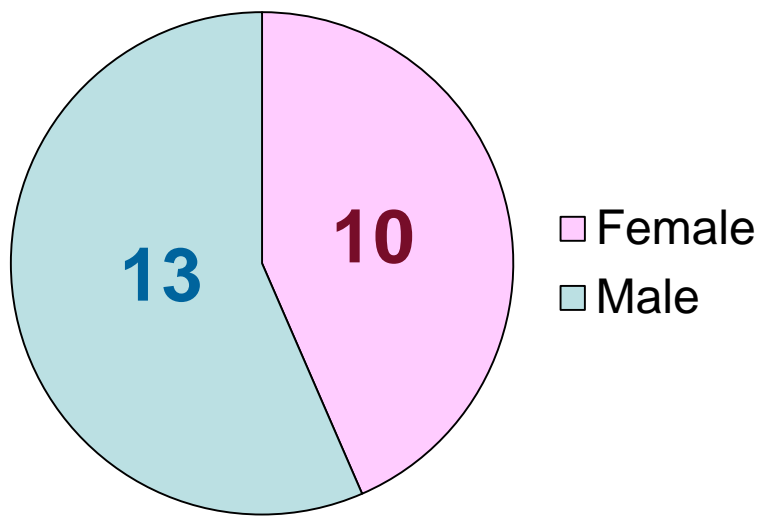
Recruitment

Implemented
 Lost
 Regained

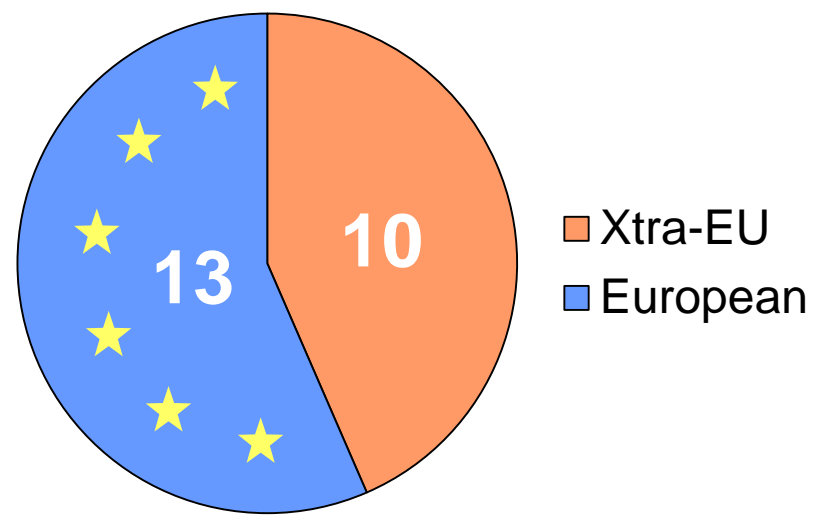


Fellows

Gender



Nationality



Secondments

ESR 1	ULIV	→ CERN	4 weeks
ESR 2	ALBA	→ Soleil	3 weeks
ESR 4	CERN	→ Polish Light Source	1 week
ESR 5	CERN	→ Helmholtz-Zentrum Berlin für Materialien und Energie	8 weeks
ESR 6	ESS	→ ISA, Centre for Storage Ring Facilities	3 weeks
ESR 7	GSI	→ RIKEN	4 weeks
ESR 10	ULIV	→ Thermo Fisher	2 weeks
ESR 16	RHUL	→ High Energy Accelerator Research Organization – KEK	2 weeks
ESR 17	US/CNA	→ ETH Zurich	2 weeks
ESR 18	US/CNA	→ GSI	8 weeks
ESR 19	CST	→ Barcelona Supercomputing Centre	1 week
ESR 20	ULIV	→ Middle East Technical University (METU) Ankara	1 week
ESR 21	Cosylab	→ AlbaNova University Center, Stockholm	2 weeks
		→ University of Ljubljana	12 weeks
ESR 22	Inst. Tech.	→ European Spallation Source – ESS	6 weeks
		→ Institute of Modern Physics – Chinese Academy of Science	3 weeks
		→ ESRF	4 weeks
		→ Michigan State University	2 weeks
ESR 23	US/CNA	→ Instituto de Ciencia de Materiales – CSIC	2 weeks

Training – oPAC Schools

1 st School	“CERN Accelerator School”	Univ. Granada, <i>Spain</i>	Oct – Nov 2012
	“Joint Universities Accelerator School”	Archamps, <i>France</i>	Jan – Feb 2013
2 nd School	“Complementary Skills School”	Univ. Liverpool, <i>UK</i>	Jun 2013
3 rd School	“Advanced School on Accelerator Optimization”	RHUL, <i>UK</i>	Jul 2014
4 th School	“Advanced Researcher Skills”	Univ. Liverpool, <i>UK</i>	Jun 2015



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- Univ. Granada, *Spain* Oct – Nov 2012
- Archamps, *France* Jan – Feb 2013
- Univ. Liverpool, *UK* Jun 2013
- RHUL, *UK* Jul 2014
- Univ. Liverpool, *UK* Jun 2015

- Presentation skills
- Scientific writing
- Project Management
- Intellectual Property



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- RHUL, *UK* Jul 2014
- Univ. Liverpool, *UK* Jun 2015

- Grant Writing
- Science Communication
- Networking and Career Building
- CV Writing and Interviews



Training – oPAC Topical Workshops

1 st TW	“Grand Challenges in Accelerator Optimization”	CERN	Jun 2013
2 nd TW	“Libera Workshop”	Inst. Tech., <i>Slovenia</i>	Apr 2014
3 rd TW	“Beam Diagnostics”	Cividec, <i>Austria</i>	May 2014
4 th TW	“Computer-Aided Optimization of Particle Accelerators”	GSI, <i>Germany</i>	Mar 2015
5 th TW	“Knowledge Transfer”	Univ. Liverpool, <i>UK</i>	Jun 2015

Training – oPAC Topical Workshops

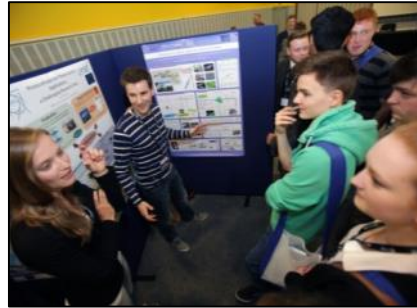
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- Fully organized by the fellows
- Budget of 10,000 €



Other oPAC events

Symposium on Lasers and Accelerators for Science & Society, Liverpool, 26 June 2015



- ➔ 250 participants
- ➔ 150 local students
- ➔ webcast
- ➔ Reach to $\sim 4 \times 10^6$ people

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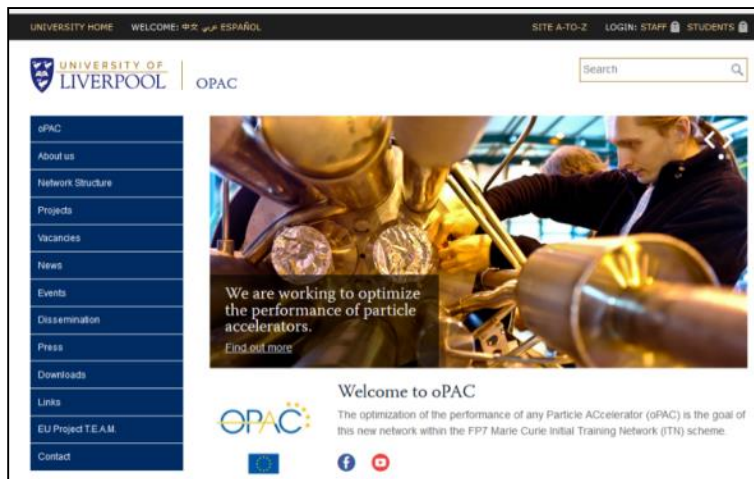
International Conference on Accelerator Optimization, CNA, Spain, 7 – 9 October 2015



- ➔ 70 participants
- ➔ Public talk
- ➔ Proceedings published in PRAB

Dissemination & Communication Online

- Website www.opac-projec.eu
- Facebook
- Twitter



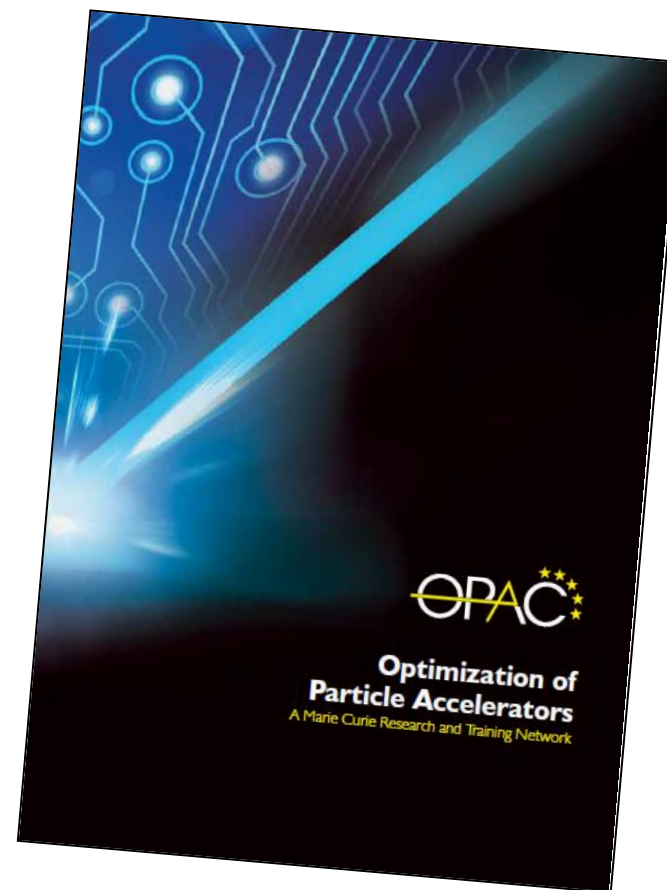
Dissemination & Communication Newsletter

- Published quarterly
- Sent to > 600 people
- News about:
 - fellows
 - partners
 - events
 - etc.



Dissemination & Communication **Brochures**

- Leaflet and brochure
- Two editions
- Distributed at events and available online



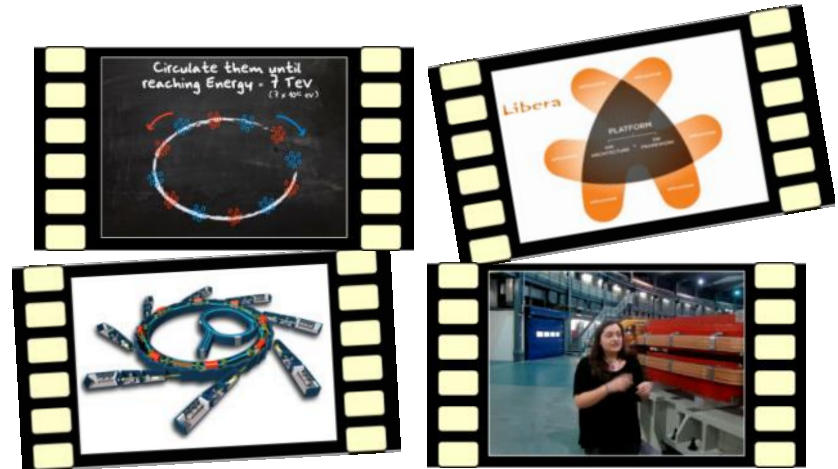
Dissemination & Communication Exhibitions

- Promotional stands in major international conferences (IBIC, IPAC, etc.)



Outreach

- School visits
- Science festivals
- Videos



Scientific Outcome:

- > 35 Journal Papers
- > 100 Contributions to International Conferences and Workshops
- 5 PhD Theses (so far)
- Most fellows got an extension in the host institution (2 with a permanent contract), the others have found a job outside the network.

Problems and solutions

- Recruitment
- Communication, updates (CDP, activities, news)
- Response
- Visa applications

Fellow Case 1

Nov 2012 – Oct 2015, University of Liverpool

Training

- Joint University Accelerator School (JUAS), Jan – Feb 2013
- Spring/Summer Cockcroft Institute Lectures, 2013
- MATLAB & Simulink with LEGO MINDSTORMS NXT, Jul 2013
- STEM Ambassador Induction, Daresbury Laboratory, May 2013

Secondments

- CERN, 4 weeks

Conferences

- PAC2013, Pasadena, CA (2013)
- 22nd Int. Workshop on Deep-Inelastic Scattering, Warsaw, Poland (2014)
- IPAC 15, Richmond, VA (2015)
- 23rd Int. Workshop on Deep-Inelastic Scattering, Dallas TX (2015)

Fellow Case 1

Nov 2012 – Oct 2015, University of Liverpool

Publications

- E. Cruz-Alaniz, D. Newton, R. Tomás, and M. Korostelev, Physical Review Special Topics: Accelerators and Beams 18, 111001 (2015)
- E. Cruz-Alaniz and A. Valloni, Proceedings of Science DIS2014 (2014) E. Cruz-Alaniz, M. Korostelev, D. Newton, and R. Tomás, Proceedings of PAC2013, Pasadena, CA USA (2013)

Outreach

- Video “Upgrades of the LHC” on YouTube
- Talks at school in the Liverpool area
- Talks at high school in Mexico City

Fellow Case 1

Nov 2012 – Oct 2015, University of Liverpool

Career outcomes

- Broad expert in the design and optimisation of accelerator lattices for high energy colliders.
- Expertise using a wide range of simulation codes and understanding the physics behind them.
- Ph.D. from Liverpool University.

PDRA in the John Adams Institute, Oxford

Fellow Case 2

Sep 2012 – Aug 2015, Inst. Tech. (Slovenia)

Training

- Libera Workshop 2012, Oct 2012
- CERN Accelerator School, Oct – Nov 2012
- Libera Workshop 2013, May 2013
- Supertraining program: Slovene, Nov 2013

Secondments

- European Spallation Source (Sweden), 6 weeks
- Institute of Modern Physics – Chinese Academy of Science, 3 weeks
- ESRF (France), 4 weeks
- Michigan State University (USA), 2 weeks

Fellow Case 2

Sep 2012 – Aug 2015, Inst. Tech. (Slovenia)

Conferences

- Libera Workshop 2014, Solkan, Slovenia (2014)
- International Particle Accelerator Conference - IPAC2015, Richmond, USA (2015)
- Libera Workshop 2015, Solkan, Slovenia (2015)
- Diagnostic Experts of European Light Sources (DEELS), Barcelona, Spain (2015)
- HPPA workshop, Lanzhou, China (2015)

Publications

- G. Jug, M. Cargnelutti, and K.B.Scheidt, Proceedings of IBIC2013 (2013)
- M. Cargnelutti, G. Jug, and R. Hrovatin, Proceedings of PAC2013 (2013)
- M. Cargnelutti and H. Hassanzadegan, Proceedings of IBIC2014 (2014)
- M. Znidarcic, E. Janezic, and M. Cargnelutti, Proceedings of IPAC2015 (2015)
- M. Cargnelutti and K. B. Scheidt, Proceedings of IPAC2015 (2015)
- S. Zorzut, M. Cargnelutti, D. Tinta, and S. G. Hunziker, Proceedings of FEL 2015 (2015)

Fellow Case 2

Sep 2012 – Aug 2015, Inst. Tech. (Slovenia)

Outreach

- Talks at high-school in Tolmezzo (Italy)
- Talks at high-school in Nova Gorica (Slovenia)
- Video “Common HW and SW Platform for different Particle Accelerators” on YouTube

Career outcomes:

- Expert for the instrumentation used in accelerators to measure the beam position, beam losses and beam current.
- Deep understanding in how the beam instrumentation works and how the development cycle for a new instrument is organized.
- Network of contacts and collaborations in the beam diagnostic community.

Permanent contract in Instrumentation Technologies, Slovenia

Good luck AVA!

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