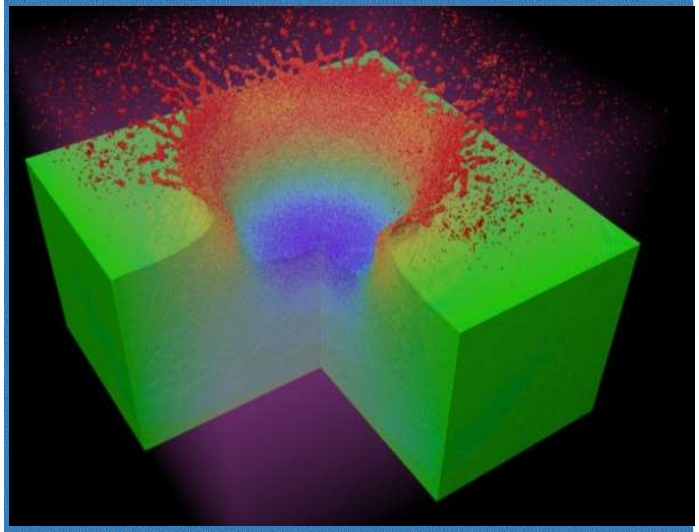
Tesina final de carrera



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FING, Universidad Nacional de Cuyo Mendoza, Argentina

https://sites.google.com/site/simafweb

Funding:

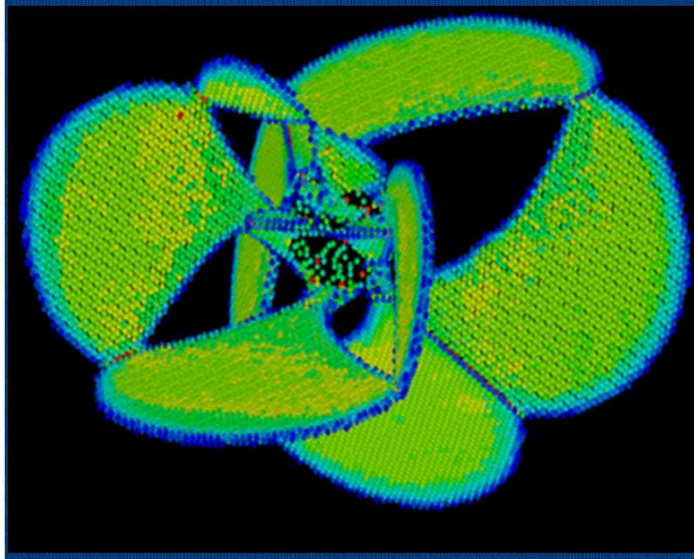
Agencia CyT, Argentina

FING, U Mendoza

SIIP, UN Cuyo

Scientific Method

FING-UNCUYO



https://meet.jit.si/TesinaFinal-FING-UNCU

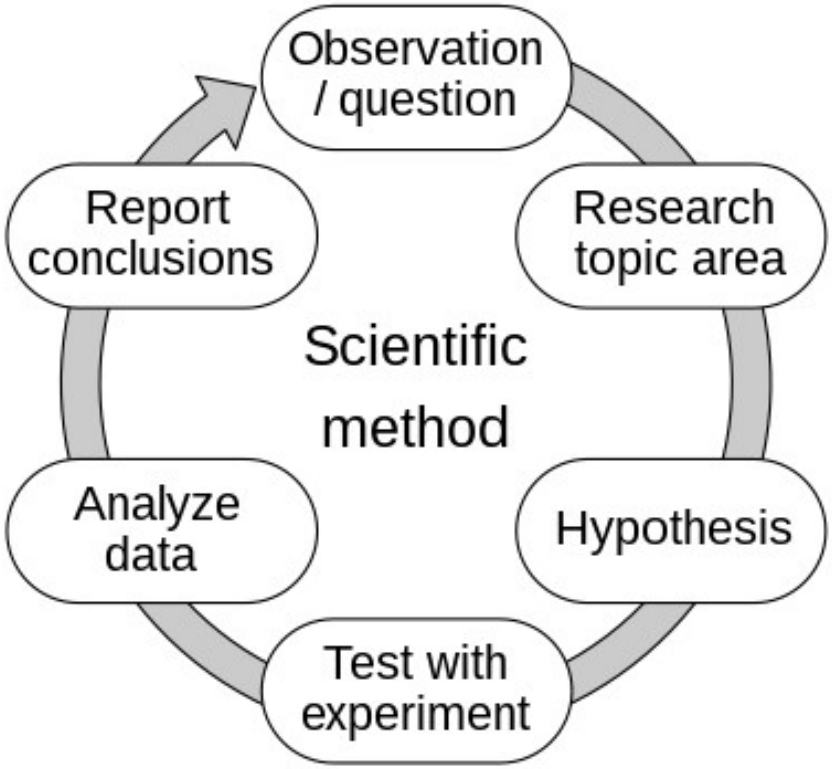
SiMAF

Outline

- **Introduction to the Scientific Method.**
- **Scientific "system".**
- **Presenting scientific results in publications and meetings.**
- **Thesis planning**
- **Thesis writing.**
- **Thesis defense.**

Scientific Method

1. Define a question
2. Gather information and resources (observe)
3. Form an explanatory hypothesis
4. Test the hypothesis by performing an experiment and collecting data in a reproducible manner
5. Analyze the data
6. Interpret the data and draw conclusions that serve as a starting point for a new hypothesis
7. Publish (communicate) results
8. Retest (frequently done by other scientists)

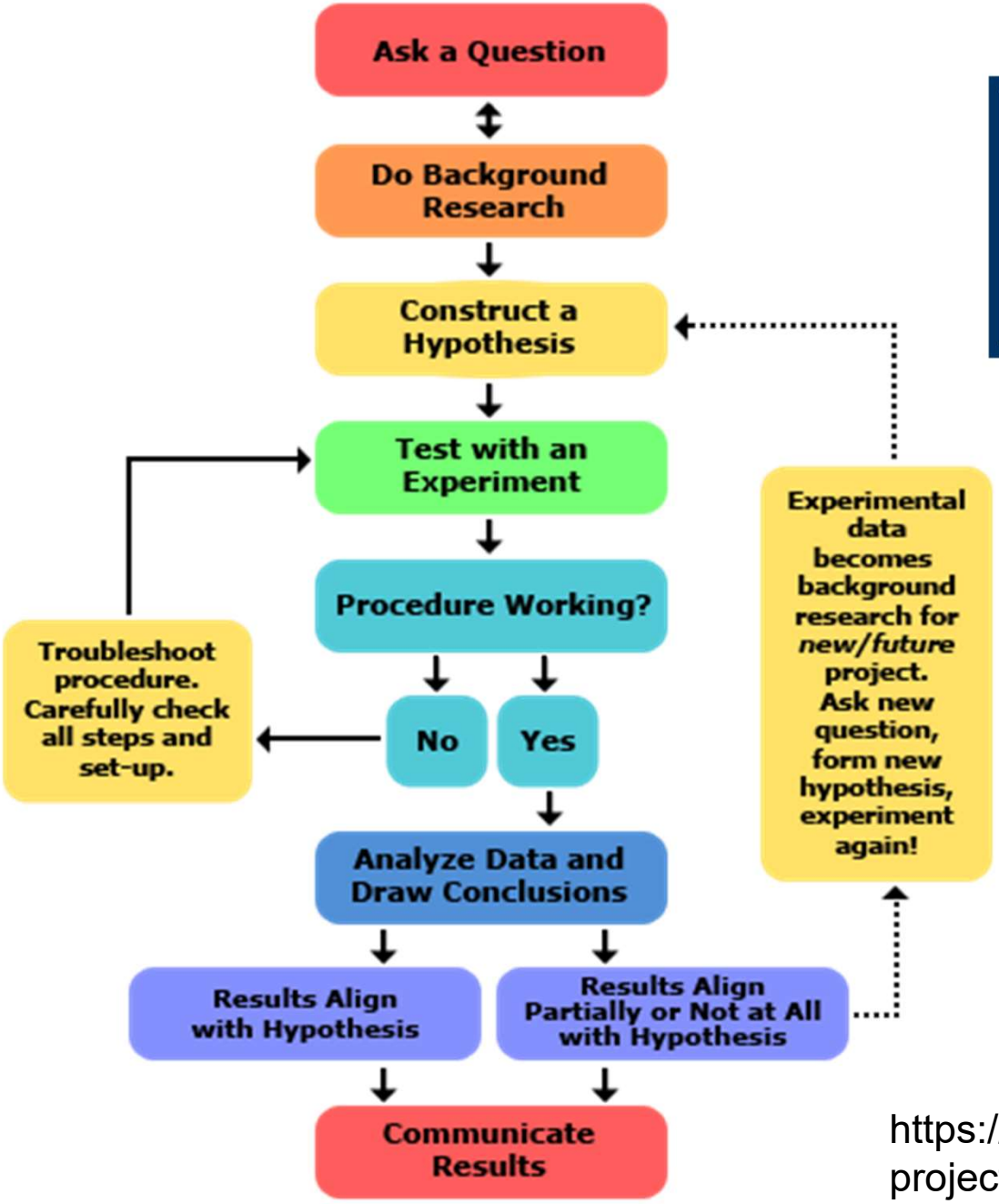


https://en.wikipedia.org/wiki/Scientific_method

https://en.wikipedia.org/wiki/Outline_of_scientific_method
https://simple.wikipedia.org/wiki/Scientific_method
https://en.wikipedia.org/wiki/Timeline_of_the_history_of_the_scientific_method

Many other similar variations on the exact method …

Alternative view of the Scientific Method

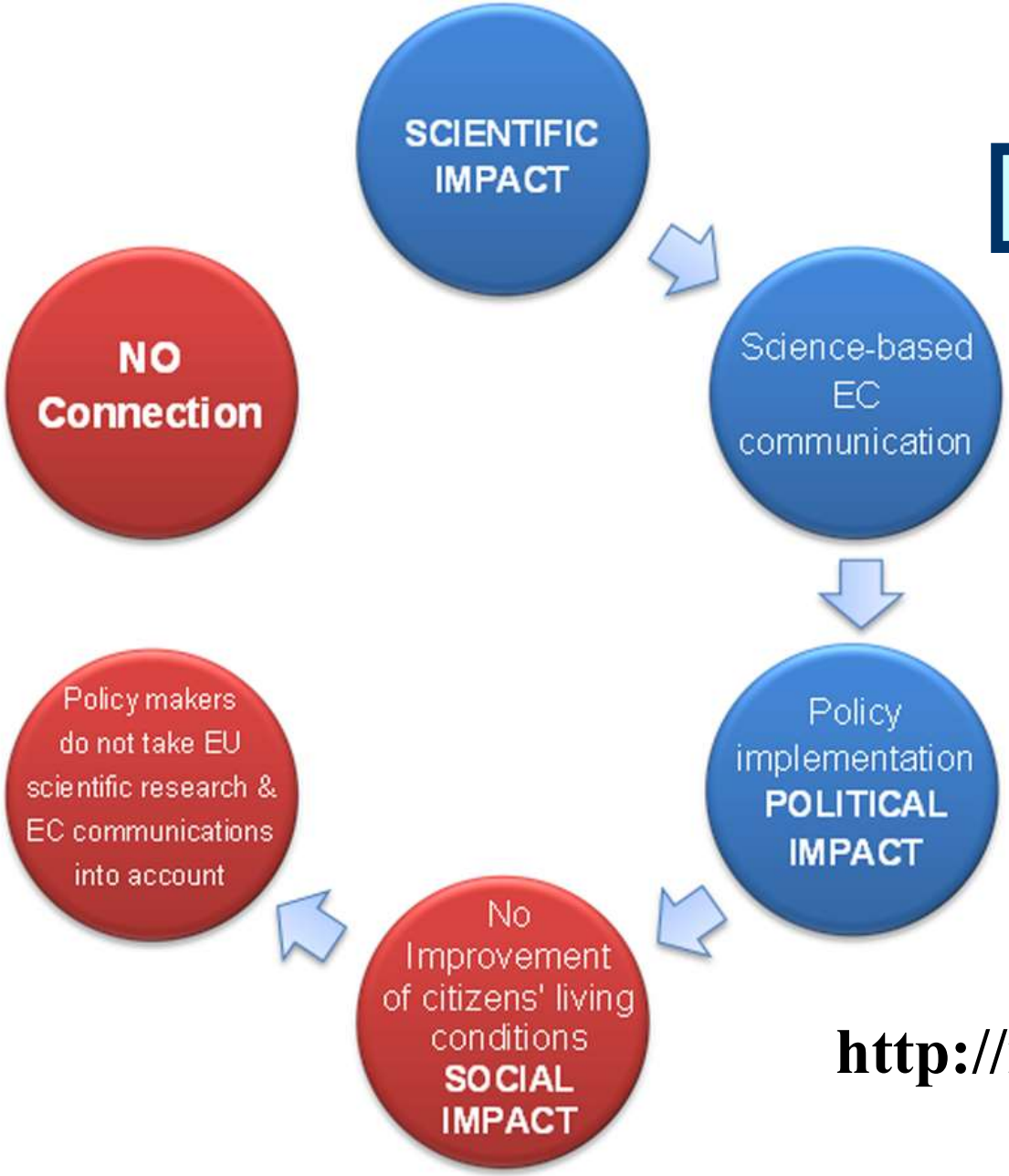


Many alternatives exist …

Some might relate more directly to your projects.

https://www.sciencebuddies.org/science-fair-projects/science-fair/steps-of-the-scientific-method

Science and society



Complex scenario …

http://impact-ev.eu/evaluating/

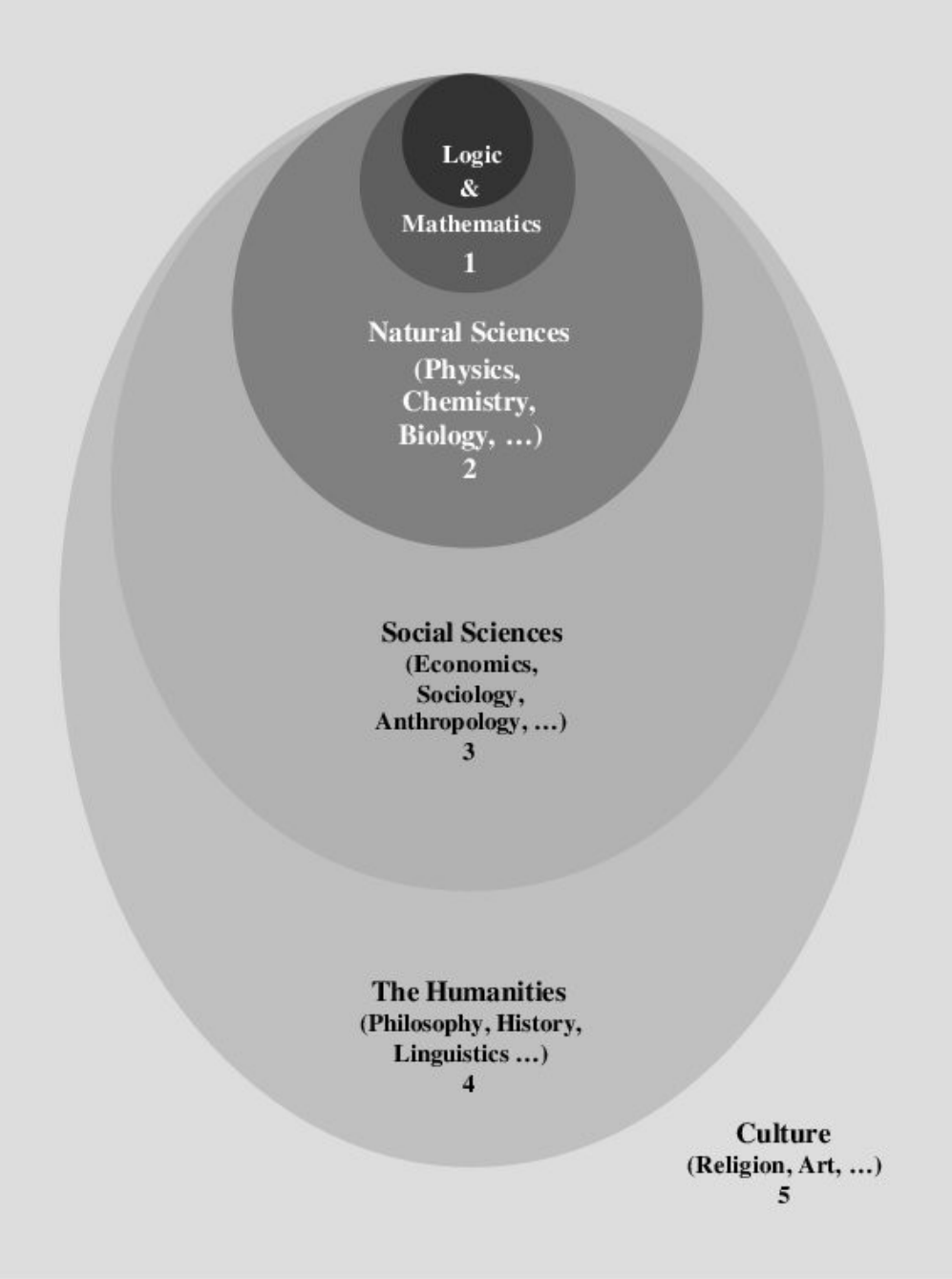
Relevance in Computer Science

Classic reference: "Scientific Methods in Computer Science", Gordana Dodig Crnkovic, Proceedings of the Conference for the Promotion of Research in IT at New Universities and at University Colleges in Sweden, Skövde, pages 126-130, 2002.
Available at:
https://www.researchgate.net/publication/2563629_Scientific_Methods_in_Computer_Science
278 citations according to Google Scholar:
https://scholar.google.com/scholar?oi=bibs&hl=es&cites=16064251154718722314&as_sdt=5

Conclusions still valid today:

Computer Sciences need the Scientific Method

Computer Science paradigms



Possible view for science …
Dodig Crnkovic (2002)

Where is
Computer Science located?

Is Computer Science Science?
Denning (2005)
http://denninginstitute.com/pjd/PUBS/CACMcols/cacmApr05.pdf

Additional Bibliography

The Scientific Method (2006):
https://www.researchgate.net/publication/6783073_WWW_The_scientific_method

Investigación en Ciencia de la Computación (Claudio Gutiérrez´ course):
https://users.dcc.uchile.cl/~cgutierr/cursos/INV/

"Three paradigms of computer science." Amnon H. Eden. Minds and Machines, Special issue on the Philosophy of Computer Science, Vol. 17, No. 2 (Jul. 2007), pp. 135–167. London: Springer. DOI 10.1007/s11023-007-9060-8 (https://sci-hub.se/10.1007/s11023-007-9060-8)

Research Methods in Computer Science: The Challenges and Issues, H. Hassani (2017). https://arxiv.org/pdf/1703.04080.pdf "… unlike most well-established science disciplines, computing research is not supported by well-defined, globally accepted methods. This is because of its infancy and ambiguity in its definition, on one hand, and its extensive coverage and overlap with other fields, on the other hand. This article … shows that despite several special parameters that make research in computing rather unique, it still follows the same steps that any other scientific research would do."

Additional Bibliography

Research Methods in Computer Science (lectures)
https://www.cpe.ku.ac.th/~aphirak/myweb/wpress/wp-content/uploads/2009/09/AllLectures.pdf

Research / Scientific Methods in Computer Science (lecture):
https://www.uio.no/studier/emner/matnat/ifi/nedlagte-emner/INF9970/h09/undervisningsmateriale/ResearchMethods-CS.pdf

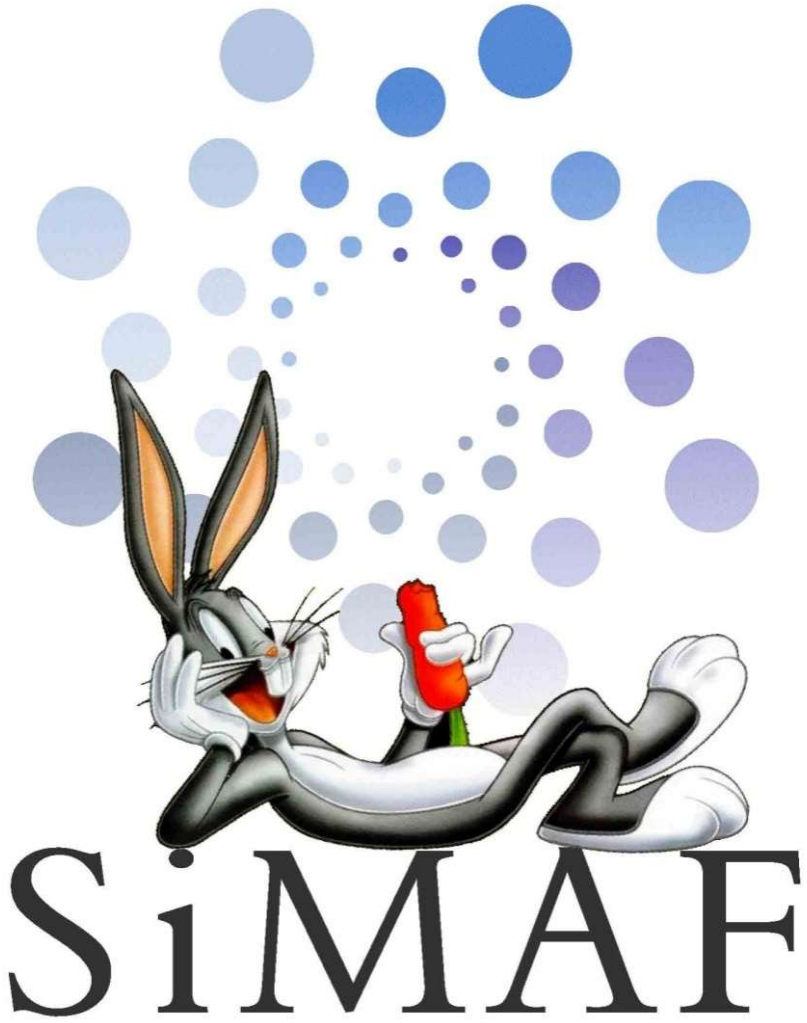
SCIENTIFIC METHODS, an online book, Richard D. Jarrard,
https://upload.wikimedia.org/wikipedia/commons/a/aa/Sm_all_cc.pdf

The Level of Scientific Methods Use in Computing Research Programs :
https://www.diva-portal.org/smash/get/diva2:865604/FULLTEXT01.pdf

Review of Methods Used in Computer Science Research, International Journal of Science and Research (IJSR), 2017. DOI: 10.21275/ART20182504,
https://www.ijsr.net/archive/v7i5/ART20182504.pdf

Many available online courses …

That’s all folks!!



Simulations in Materials Science, Astrophysics, and Physics

https://sites.google.com/site/simafweb

Web master: M.J. Erquiaga; design: E. Rim