

MSCA IF – GF: CRADLE

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Challenges and opportunities for the aerospace frontier research offered by the ERC and the MSCA programme

AIDAA Educational Series and Academy

Presentation layout

- About the project
- Starting out
  - The idea: do not think only about your strengths
  - The consortium: complementarity and profile
- Proposal writing – My experience
  - Plan in time
  - Style your writing
  - Its not just about the science
    - Career planning
    - Project management
  - External reviews
- Final thoughts

About the project

- The project will start shortly → 16th of March at Politecnico di Milano
- Current needs for future space missions
  - Extend the knowledge of asteroid composition
  - Enable multi-asteroid sampling
  - Rich in valuable resources (space mining)
- CRADLE main topics
  - Asteroid fragments dynamics
  - In-orbit particle sample and return devices
  - Physical characterization of asteroid particles
  - Start from the knowledge of Hayabusa-2 mission by JAXA
- Collaborations

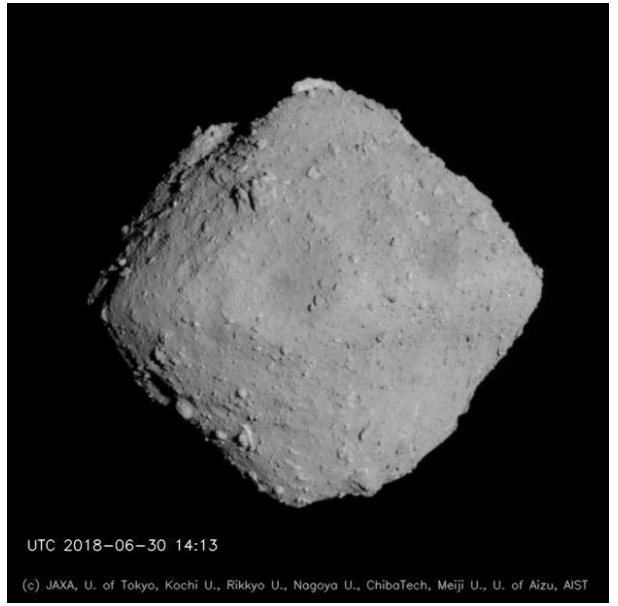


Image of Ryugu asteroid from Hayabusa-2 mission. Credit: JAXA



Starting Out

Credits NASA

The Idea

Strengths, improvement areas, and storytelling

- Identify clear objectives
- Try not to focus only on your strengths

	Strengths	Knowledge gaps	Bet on yourself
	• Use your strengths and the ones of your group as a foundation for the project	• Identify what is missing right now and why is it important • How can you use it?	• Be bold • Learn from your tasks • Shows self improvement
My example	• Small particles dynamics • Fragmentations • Continuum propagation	• Continuum propagation for small bodies dynamics • In-orbit particle collection	• Small bodies environments • Image processing

- Search for a **story to tell**: connect your strengths (starting point) with your goals, addressing the knowledge gaps you will fill and the contributions you will bring.

The consortium

Complementarity and institutional profile

- Focus on the **complementarity** of the consortium: each institution should bring something different to the table
- Stress how each part of the **consortium meets your research needs**
- Highlight how the consortium is at the forefront of your research field

Host institution

Strong expertise in orbital mechanics, perturbation theory and continuum propagation · Experience with mission design and fragmentation modelling

Main partner (Third country institution)

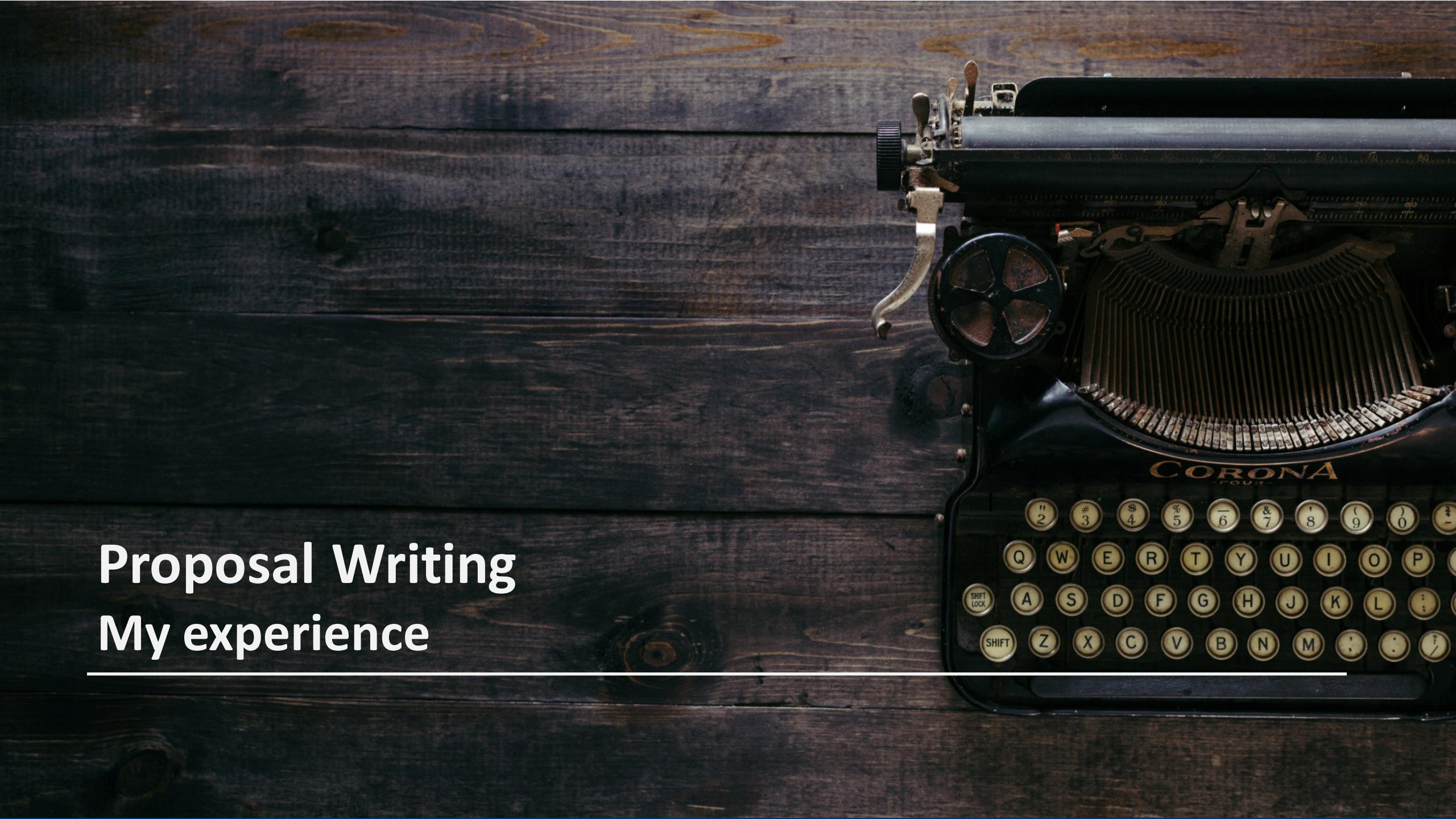
Strong expertise in asteroid missions and sample return mission · Hayabusa2: only mission to return samples from asteroids, and induce and record particle ejection from its surface

Secondment

Strong expertise in the study of fragmentations, both experimental and computational · Experience in design and development of particle detection and collection devices

Secondment

Expertise in mission and system design · Possible future application for the space debris environment



Proposal Writing
My experience

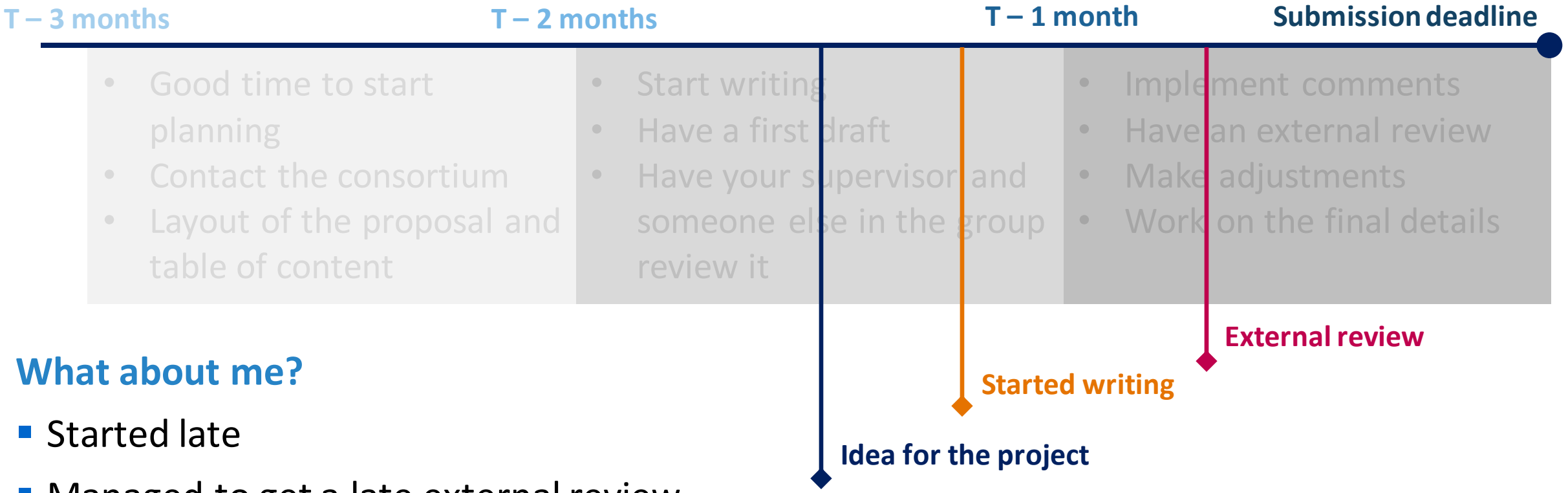
Plan in time

Start early but not too much

T – 3 months	T – 2 months	T – 1 month	Submission deadline
• Good time to start planning • Contact the consortium • Layout of the proposal and table of content	• Start writing • Have a first draft • Have your supervisor and someone else in the group review it	• Implement comments • Have an external review • Make adjustments • Work on the final details	

Plan in time

Start early but not too much



What about me?

- Started late
- Managed to get a late external review

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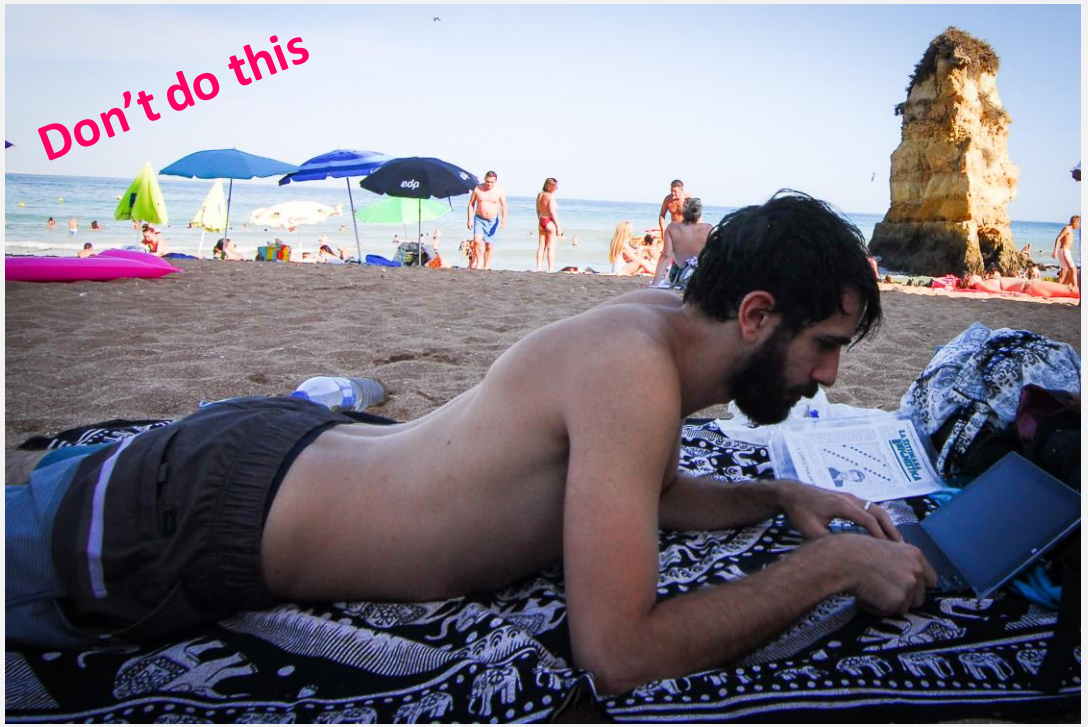
Submission deadline



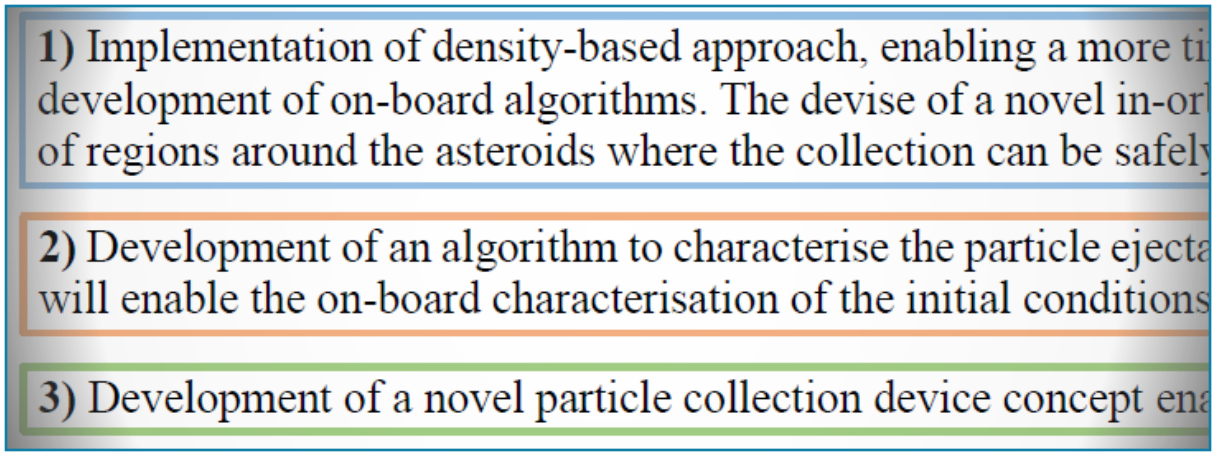
What about me?

- Started late
- Managed to get a late external review
- Worked full time to implement revisions and refine the details

Style your writing

Conciseness, highlights, visual aids

- The whole proposal must be within 10 pages
  - Try to be concise and direct
  - Allocate pages according to the section importance: Excellence (50%), Impact (30%), Implementation (20%)
- Highlights important concepts
  - **Text boxes** for objectives and more important concepts



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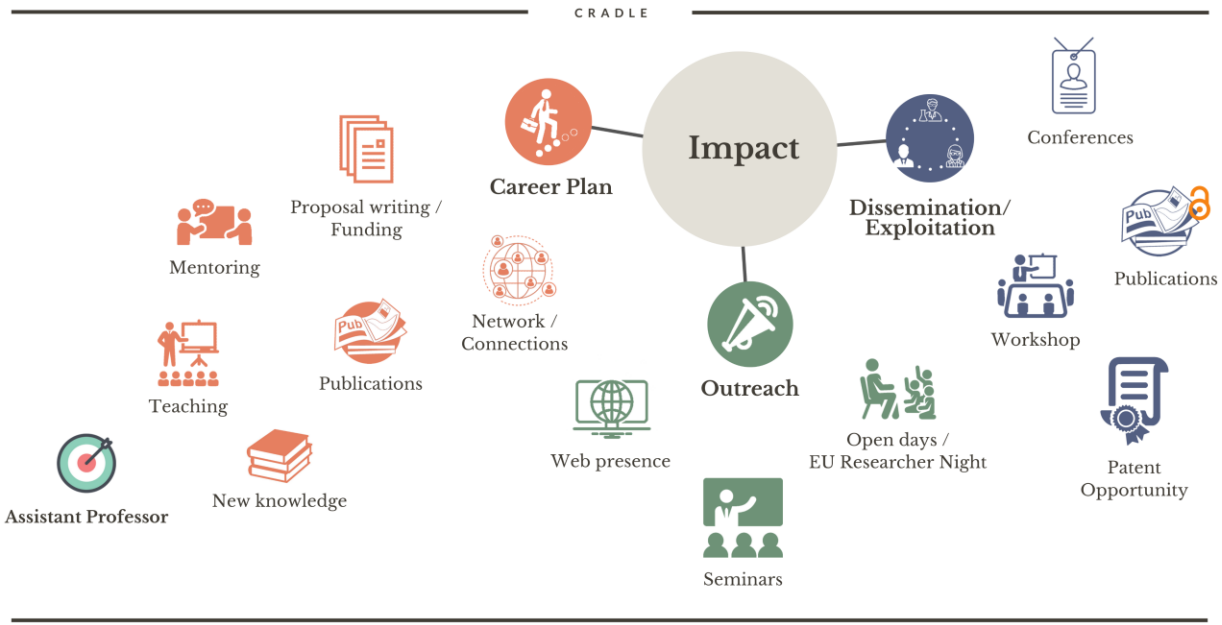
  - Bold and underlined words
  - Use **colour-coding**
- Insert few but meaningful **diagrams**



It’s not only about the science

Other key ingredients

- The scientific objectives are the fundamental part of the proposal; however…

Career impact	Project implementation

▪ Match scientific objectives to growth opportunities
▪ Identify a career path
▪ Highlight how the fellowship will contribute to the career goals
▪ Identify key ingredients for your growth
  ▪ Networking, publications, teaching, etc.
	▪ Identify the work packages
	▪ Identify clear milestones and deliverables
	  ▪ Connect them to the scientific and career planning parts
	▪ **Use tables**
	  ▪ Clear and concise organisation
	  ▪ Save space
	▪ Include risk management

External reviews

- Try to have an external review if you have the chance
  - **Ask your university** if they provide such a service
- Gives you a better perspective on what the actual reviewers are searching for
- It is useful to have someone looking at your proposal with “fresh eyes”
- They also check your CV!

- In my case, I had almost 40 comments (mainly on the implementation part) to my proposal and few adjustments to the CV
- Most certainly I would not have got the Fellowship without the external review

Final thoughts

- These were few suggestions I thought would be valuable; however, it will be your proposal…make it your own!
- Regardless of the outcome, writing the proposal will be beneficial in many ways
  - Explore new possibilities and novel approaches
  - Establish connections with partner institutions and researchers
  - Experience with EU proposals and judging criteria
  - Experience in project management and scheduling

Good luck with your proposal!



This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Sklodowska-Curie grant agreement No 896404 - CRADLE

Credit: NASA

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