PARACAT: PARAMAGNETIC SPECIES IN CATALYSIS RESEARCH. A UNIFIED APPROACH TOWARDS HETEROGENEOUS, HOMOGENEOUS AND ENZYME CATALYSIS

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European Commission | Horizon 2020 European Union funding for Research & Innovation

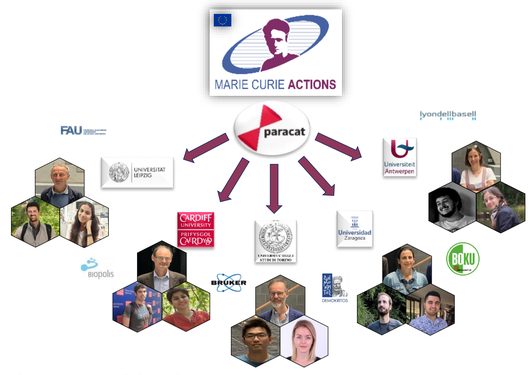
MARIE CURIE ACTIONS

Paracat in a nutshell

Who we are

PARACAT is set up by a consortium formed by:

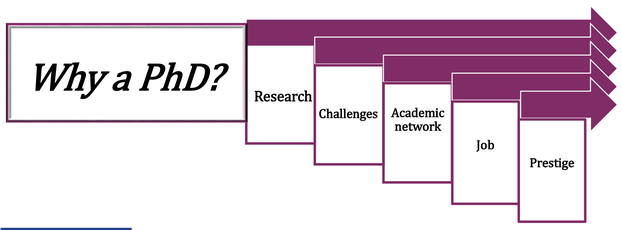
1. 5 academic beneficiaries
2. 1 research institution
3. 3 industrial organizations
4. 2 academic Institutions as partners
5. 10 early-stage-researchers (ESRs)



What we do

The primary goals of the project include:

1. Designing new catalysts based on earth-abundant and sustainable elements
2. Using a bioinspired approach to discover new and more sustainable reaction pathways for the activation of small molecules and selective oxidations
3. Enabling new routes for polymerization and de-polymerization reactions

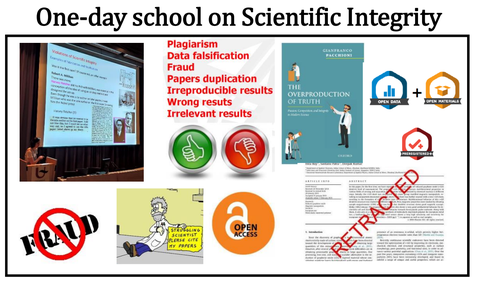


Marie Skłodowska-Curie Actions

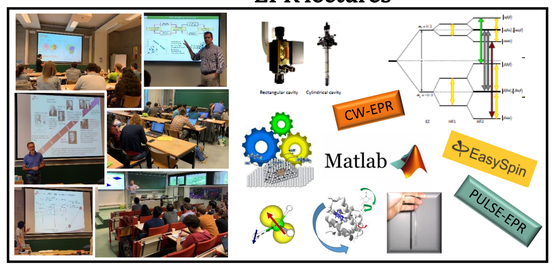
The project PARACAT has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement – European Joint Doctorate Grant number 813209

PARACAT Summer School
14-20 July 2019 – University of Antwerp

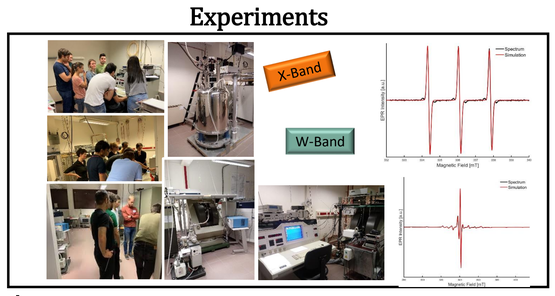
One-day school on Scientific Integrity



EPR lectures



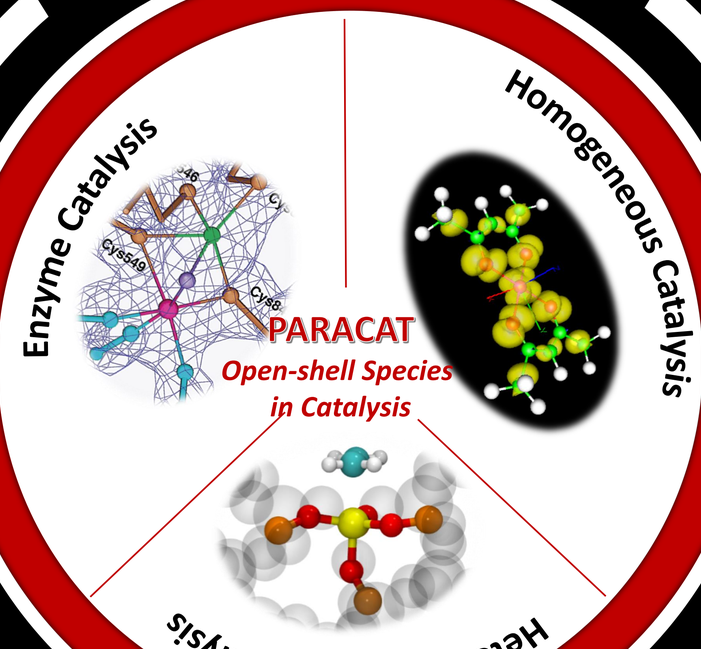
Experiments



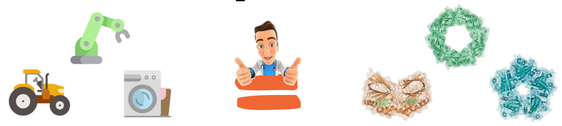
Certification

Don't miss our next School in **Cardiff, in January 2020**!

All information available soon @ https://paracat.eu/wp/



Enzimes are powerful machines!



Enzymes are biological machines which perform (bio) chemical processes in the living organisms. The structure of an enzyme determines its function and, as any other machine, enzymes possess an engine, which scientists call **active site:** this is where the (bio) chemical reactions occur.

What about EPR?

Understand your system
↳ Improve its performance
↳ Develop new applications

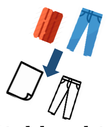
Fast reactions? Then you need a **freeze-quenching device**!

Did you know?

With enzymes you can…

… Make cheese

… Produce lactose-free milk for intolerant people

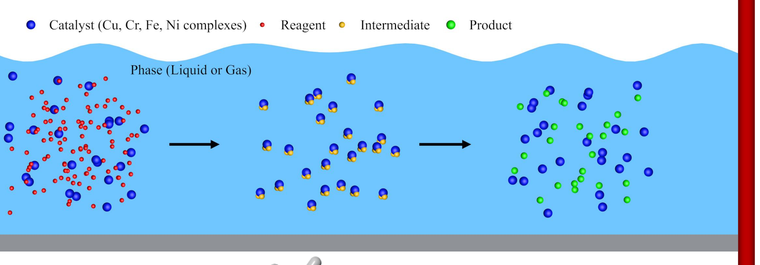


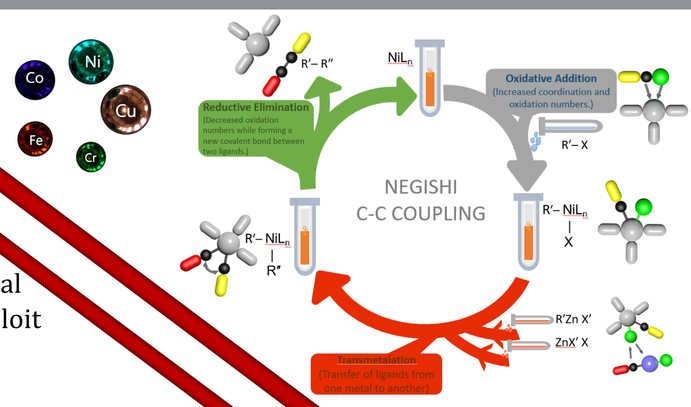
… Biobleaching clothes and paper

… Clean better and eco-friendly

Homogeneous catalysis

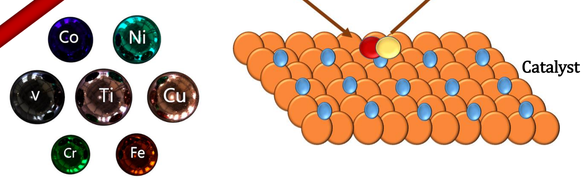
Homogeneous catalysts operate in the same medium as the reagents, typically liquid or gas. They can be extremly effective but can be difficult to isolate from the product.
Because many of these reactions involve paramagnetic centers, EPR gives us an amazing tool to see the reactions step by step and observe elusive intermediate states.



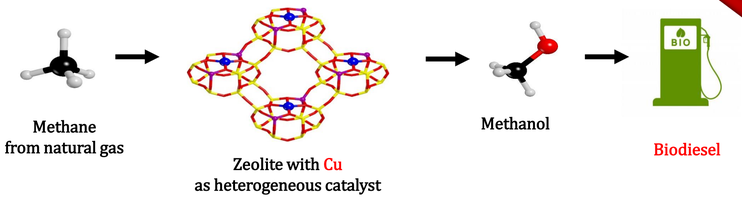


Heterogeneous catalysis

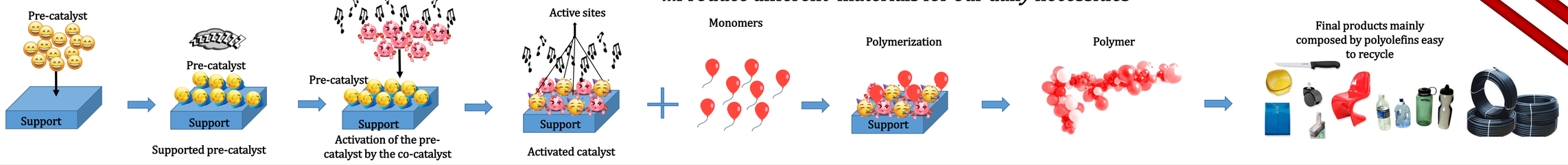
Heterogeneous catalysts have different phase from the reagents and a larger number of active sites in respect to the homogeneous catalysts. **EPR** can give us a fundamental aid in the understanding of their structure and catalytic mechanisms since the most of them exploit paramagnetic centers as **active sites**. They are able to….



Turn small molecules into biofuel…



…Produce different materials for our daily necessities



A focus on ethics and integrity…

"Researchers, research institutions and organisations ensure access to data is as open as possible, as closed as necessary, and where appropriate in line with the FAIR Principles (Findable, Accessible, Interoperable and Re-usable) for data management"

ALLEA ALL European Academies

OSF

Commitment

The ParaCAT programme promotes the good conduct in research and embraces the principle of the ALLEA code

Awareness

Special sessions are organised during ParaCAT meetings and schools with the support of an ethicist, in order to encourage productive discussions

Action

The ParaCAT consortium has already implemented **the Open Science Framework** network