



## PHOSPHATE ADSORPTION THROUGH IRON OXIDE NANOPARTICLES



### OUR OFFER

- Start: preferably from February 2019 on, at least for 5 months;
- Place: Wetsus, Leeuwarden, Netherlands;
- Allowance: 350 €/month;
- Working in a multidisciplinary and international environment.

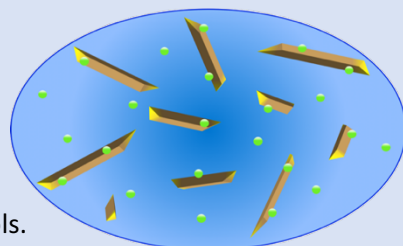
### BACKGROUND

Phosphorus (P) is an essential nutrient which have roles in many vital processes of living beings. However, when dispersed in water bodies, in the form of **phosphate** ( $\text{PO}_4^{3-}$ ), it can act as a pollutant, leading to **eutrophication** and eventually algae bloom. Eutrophication can already take place at a concentration of  $10 \mu\text{m/L}$ . The process able to go below this very low concentration is **adsorption**. **Iron oxides**, among the other adsorbents, display great features both from performance and economical points of view. They have good affinity with phosphate, allow **regeneration** of the adsorbent and **recovery** of phosphate (reused as fertilizer). To improve all these features, an in-depth study of the adsorption mechanism and molecular interaction is needed. This interdisciplinary insight into the fundamentals consists in a journey from *nanoscience* to *nuclear physics*, passing through *physical* and *analytical chemistry*.



### TASKS

You will have to synthesize and characterized nanoparticles of different iron oxide species, employing them as adsorbents in batch experiments. Adsorption phenomena will be investigated with different techniques (ICP, FTIR, RAMAN, ...), as well as adsorbents characteristics (MÖSSBAUER SPECTROSCOPY, SEM-EDX, ...). You may also improve the experimental protocols.



### REQUIREMENTS

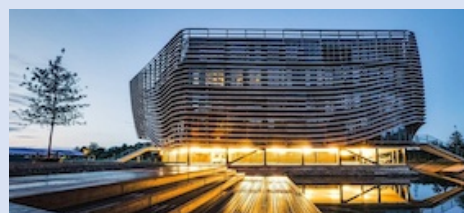
We are looking for a student with a background in Chemistry, Chemical Engineering, Environmental Engineering, Materials Sciences, with already experience of work in a chemical lab. The student has to be fluent in English, highly motivated, enthusiastic, with active thinking and not afraid of working independently.

### HOW TO APPLY

The offer is open to all EU students and to non-EU students already living in the Netherlands. If you are interested in this project, send an e-mail to Carlo Belloni: [carlo.belloni@wetsus.nl](mailto:carlo.belloni@wetsus.nl) (object: APPLICATION PHOSPHATE ADSORPTION), together with the following attachments:

- CV;
- Motivation letter (max 1 page);
- Transcript of records.

A short Skype interview will then be scheduled.



PHOSPHATE RECOVERY THEME: <https://www.wetsus.nl/phosphate-recovery>