A postgraduate research scholarship is available to undertake a Doctor of Philosophy program based at The University of Queensland (UQ) in the field of Civil and Environmental Engineering.

Research Topic

In the last century, the Haber–Bosch process allowed for the large-scale production of fertilizers. This process has supported almost half of the world's population through increased food production. However, the use of nitrogen fertilizers comes with environmental side effects such as climate change (the Haber-Bosch is an energy intensive process responsible for ~3% of the total energy consumption) and eutrophication of surface water.

Future scenarios suggest a potential doubling of fertilizer use in the coming 100 years. Therefore, to reduce these side-effects there is a need to improve our nitrogen use efficiency and explore innovative reuse options. In this context, in the past decades, several technologies have been proposed that enable recovery of nitrogen and energy from wastewater rather than using the conventional activated sludge process that oxidizes the nitrogen to its elemental form N₂ on the expensive of electricity. Although a major step forward, most of these technologies involve processes allowing for only a part of the total resources to be recovered. There is currently no technology available that allows complete recovery of nitrogen from waste streams containing low to medium concentrations of nitrogen.

The objective of this project is therefore to make significant advances towards development of sustainable and cost-effective nitrogen recovery from waste streams containing and subsequent valorization into valuable added products such as fertilizer or feedstock. To achieve this, the PhD will (i) conduct extensive laboratory scale experiments to gain fundamental understanding in physical-chemical and biological processes, (ii) long-term field studies to translate this fundamental understanding and test the technology under field conditions. This multi-disciplinary project falls into the field of Environmental Engineering and Environmental Biotechnology and will be in close collaboration with the Australian and European Water Industry.

Eligibility Criteria

The successful candidate should:
- have a strong background in environmental engineering, (bio)chemistry and water related processes.
- be highly motivated;
- have excellent verbal and written communication skills in English;
- hold an Honours I or high Honours IIA degree.

Value

Successful candidate will receive a stipend of $25,849 per annum which will be indexed for the duration of the award. This scholarship will be for three years with a possible extension of up to six months.
How to apply

Interested individuals should submit an expression of interest including the following in a single pdf to Dr Ilje Pikaar (i.pikaar@uq.edu.au):

- curriculum vitae (including lists of publications and 3 referees with contact details);
- brief statement about research interests and experience (1-2 pages);
- academic transcripts (undergraduate/postgraduate, with English translations if required);
- evidence of English proficiency;


APPROVAL AND ENROLMENT

The successful applicant will be formally invited to apply for a PhD, and will then need to submit the following documentation:

- Hardcopy of completed certified academic transcripts and official certification of degrees and diplomas awarded including certified English translations where required (unless qualifications are from the University of Queensland)
- Evidence of English proficiency, if required; the minimum scores for IELTS, TOEFL and Pearson Test are:

<table>
<thead>
<tr>
<th>IELTS Academic</th>
<th>TOEFL – Paper based</th>
<th>TOEFL – Internet Based (iBT)</th>
<th>Pearson Test</th>
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</thead>
<tbody>
<tr>
<td>Overall Score</td>
<td>All other sub-bands</td>
<td>Total Score</td>
<td>TWE (Test of written English)</td>
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<tr>
<td>6.5</td>
<td>6</td>
<td>570</td>
<td>5</td>
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Tests expire after two years and must be valid at the time of your commencement of candidature.

- Certified documentary evidence of the duration and attendance status of any previous research higher degree enrolment. If the previous research higher degree enrolment was undertaken in Australia, students must also provide evidence of consumed research higher degree student load, measured in Equivalent Full-time Student Load (EFTSL).

The scholarships for the PhD degree are subject to academic approval, and the candidates will be enrolled in Research Higher Degree (RHD) programs at UQ - See more at: http://www.uq.edu.au/grad-school/our-research-degrees.