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Pilot-plant processing of lignocellulosic biomass through pyrolysis and hydrothermal methods

Postdoctoral Fellow

Host: Prof. JF Görgens

Commencement: The fellowship is available for a minimum period of 12 (twelve) months, with a starting date of no later than 15 January 2026, although an earlier starting date would be preferred; the fellowship is renewable for up to 4 years thereafter, based on performance and funding availability.

Scholarship: A competitive scholarship has been granted for the position and, provided that the necessary procedures are put in place, this will be awarded tax free. Please note that postdoctoral fellows are not appointed as employees and are therefore not eligible for employee benefits.

An opportunity for a postdoctoral researcher focused on pilot-plant processing of lignocellulosic biomass through pyrolysis and hydrothermal methods is presently available in the research programs of the Department of Chemical Engineering. The position will include pilot-scale optimisation of biomass processing with both pyrolysis and steam-explosion methods, with each method applied to achieve a different outcome, based on the chemical properties of liquid and solid products obtained. While the liquid products from these two processes will be considered for final application as is, the solid products will be further processed, including methods such as anaerobic digestion for biogas production. Both pyrolysis and steam explosion pilot-plant equipment have the capacity to process tens of kilograms of biomass materials per day of operation.

This research group is currently collaborating with industrial and academic partners on the application of these processing options for the conversion of lignocellulosic biomass into higher-value energy, chemical and material products, which require the optimisation of process conditions for specific biomass materials that are of industrial interest. The postdoctoral researcher will be expected to contribute significantly to:

A. Independent and safe operation of pilot-plant equipment for pyrolysis and steam-explosion pilot-plant equipment, in collaboration with postgraduate students and other researchers that will participate in these experimental projects.

B. Critical evaluation of existing technology performances, based on published literature and previous experience in the research group, with proposals for technical development to improve these, taking the unique objectives of these research projects into account.

C. Provide technical support to other researchers in the group working on similar projects.

D. The publication of research outputs from current and previous projects, relevant to the field of research.

E. Development of new areas of research within the research group, including the preparation and submission of new funding proposals to sustain research activities

Requirements:

A Ph.D. in Chemical Engineering, obtained within the past five years from a recognised institution, with a strong background in processing of lignocellulosic biomass through pyrolysis and/or hydrothermal methods, as described above. Candidates with previous experience with microbial bioprocessing or

anaerobic digestion of pretreated lignocelluloses, or pilot-scale biomass processing, are particularly encouraged to apply.

Application:

Application documents: Closing date for applications is 31 July 2025. Interested candidates should provide a cover letter, CV, complete academic transcripts, and contact details of at least three academic references. All documents should be merged into a single PDF and attached to the application. Incomplete applications will not be considered. Applications can be sent to Prof. JF Görgens at jgorgens@sun.ac.za.

Stellenbosch University reserves the right not to fill the position.