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Postdoctoral Fellowship

- Scope of Research:** This post-doctoral research, which is a collaboration between the South African Grape and Wine Research Institute and the Department of Chemical Engineering, Stellenbosch University, aims to enhance understanding of mass transfer rates, transient phase compositions, and homogeneity in wine tanks during nitrogen gas sparging to lower wine dissolved oxygen levels. Utilizing principles from previous research, computational fluid dynamics (CFD) will provide insights into oxygen transfer rate variations across tank volumes. Factors such as wine composition, temperature, gas flow, tank geometry, and sparger design will be investigated to understand their impact on transfer rates. The study will develop a CFD model simulating multi-phase fluid flow and oxygen transfer in a commercial-size wine tank. This model will expand current knowledge of how physical and chemical factors influence mass transfer during oxygen desorption in wine. Additionally, it will provide insight into tank geometry's effect on transfer rates. Using the CFD model, novel sparger configurations will be rapidly designed and tested to control dissolved oxygen concentration. Iterative in silico testing will identify promising designs for fabrication and experimental validation. Collaborating with commercial wineries, experimental work will assess dissolved oxygen levels during fermentation and oxygen removal. This research will advance wine industry practices in oxygen management during production, enhancing product quality and stability. The fellowship is initially for one year, with the possibility of extension to a second-year contingent upon satisfactory progress.
- Requirements:** We are seeking an individual with a Ph.D. (obtained within the last 5 years) in engineering, food science, oenology or related field, with a sound background in computational modelling would be ideal.
- Commencement date:** June 2024 or as soon as possible thereafter
- Closing date:** 10 May 2024
- Enquiries:** Send a one-page letter of motivation, accompanied by a comprehensive curriculum vitae, including a list of publications and the names and contact details of two referees, to wdutoit@sun.ac.za



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(Contact details of the host):

Prof Wessel du Toit (Host)

South African Grape and Wine Research
Institute

Stellenbosch University, 7600.

wdutoit@sun.ac.za/ +27 21 808 2022

Annual stipend: R400 000 per annum

- **Postdoctoral fellows are not appointed as employees and as their fellowships are awarded tax-free, they are not eligible for employee benefits.**
- **The University reserves the right NOT to make an appointment if suitable candidates do not apply.**