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PhD in solar cooling research

CSIRO, Australia's national science organisation, is currently seeking a motivated **PhD-student for a three-year research project** in the area of solar cooling systems. CSIRO has ongoing research in the development of a new small-scale, solar-driven desiccant cooling system:

REDECool - Residential Desiccant Cooling System

Description:

Using heat to provide cooling or air-conditioning is a promising alternative to conventional chillers or air-conditioning units. Thermally driven ab- or adsorption chillers are usually being used for this, however they have several drawbacks which make them unsuitable for the Australian climate. A potentially attractive alternative is the use of a desiccant-evaporative (DEC) air-conditioning system which directly cools and dehumidifies an air stream using a desiccant material and the latent heat of evaporation of water. The regeneration of the desiccant material can be done using waste heat or solar energy at or below 80°C, making the DEC system a flexible option for most low-grade heat sources. Present technology uses large rotating wheels with a desiccant matrix structure. CSIRO is currently developing a small light-weight dehumidifier that provides solar air-conditioning to a residential house. Research in this project will be mainly be undertaken on heat and mass transfer in the desiccant dehumidifier. Research aspects with regard to this are:

- Characterisation of heat and mass transfer onto desiccant surfaces
- Development of a simulation model for heat and mass transfer in desiccants
- Verification and validation of the model on proof of concept prototype
- Characterisation of desiccant thermodynamic properties
- Design of tailored surfaces for improved performance
- Involvement in dehumidifier system design
- Development of control strategies

Start time: immediately

Location: Newcastle, NSW, Australia

Professional skills required:

- Degree in Mechanical Engineering or Chemical Engineering
- Good thermodynamic skills, commitment to obtaining expert knowledge in air-conditioning engineering.
- Experience with simulation software TRNSYS and MatLab desirable
- Demonstrated ability to generate innovative solutions whilst operating in a dynamic and challenging environment.
- Demonstrated commitment to a high level of personal performance and the provision of quality outcomes whilst working cohesively in a team environment.

Salary: AUS$ 26k p.a. (full scholarship provided)

Contact: Dr.-Ing. Paul Kohlenbach
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Please provide comprehensive CV.