

The Institute for Chemical Technology of Inorganic Materials at Johannes Kepler University Linz is offering a position starting from 01.10.2019 (or later) as a:

scientist / project assistant (3 years PhD position in Natural Sciences 30 h / week)

A memristor, or “memory resistor” will remember the value of its resistance in time. In other words, the memristor may have a low or high electrical resistance and switching between these states can be done easily by applying a defined voltage to the device. Hence, the memristor will remember its ohmic value until a new switching action occurs. This is primarily used for development of artificial synapses, resistive random access memories and sensors. When used for sensors, the memristor switches its resistive state due to extra charges generated on its surface as a result of interaction with the detected chemical. Very recent reports emphasize the relevance of using semiconducting or insulating oxides of various valve metals. All these oxides are easily produced by anodization (by applying a positive voltage to the metal while submerged in a water-based electrolyte) which tremendously decreases the production cost of sensing devices. A combinatorial route will be used for obtaining new memristive materials. First, atomic mixture deposition in a vacuum chamber allows a metallic deposit with a changing composition to form across a substrate. The resulting thin film compositional spread will not be described by a single metallic alloy, but by an entire range of alloys formed at the same time. This library of metals will be anodized so that different oxides will form and mix on the surface depending on the composition of their parent metal alloys. Metal-insulator-metal structures (identical with the structure of a simple capacitor) obtained by top electrodes patterning will be systematically screened as a function of their composition. Memristive electrical testing using lab automation robots for high throughput will reveal the best mixture of oxides for improved devices.

The opened position is part of the “Combinatorial memristive materials for sensor applications (CoMeM)” project financed by the Austrian Science Fund (FWF). Applicants must hold a diploma or master degree in material science, applied physics, physical chemistry or a related science field. The applicant should have solid knowledge in both, theoretical and practical aspects relevant for material science. Additionally, the applicant should be able to fast develop new skills as required by the particularities of the project at both theoretical and applied level. Knowledge of thin film technology and electrochemistry is desired but not necessary given a sound physical-chemical background. Practical knowledge of appropriate methods for (electro-)chemical and physical materials characterization such as EIS, CV, XRF, XRD, SEM, XPS, EDX, AFM etc. would be an advantage.

An active participation in lab use and in team activities for teaching and collaborative work is compulsory. By the end of the 3 year period, the candidate is expected to obtain her/his doctoral degree. No extension of this time frame is possible.

Candidates must be fluent in both, written and spoken English. Applications are received until the position is filled.

Gross monthly salary is € 2.162.

Disabled applicants with adequate qualification will come into special consideration.

Please send your application including CV, grade records, certificates, publication list etc. as a single .pdf file to comem2019@jku.at. Links to file-sharing websites or documents with formats other than .pdf will be ignored!

Written applications may also be sent by post to:

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