Post Specification

<table>
<thead>
<tr>
<th>Post Title:</th>
<th>Research Fellow, Characterisation &amp; Processing of Advanced Materials</th>
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<tr>
<td>Post Status:</td>
<td>Specific Purpose (1 year); Full time</td>
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<tr>
<td>Department/Faculty:</td>
<td>AMBER / CRANN / School of Chemistry</td>
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<td>Reports to:</td>
<td>Professor Nicolosi, Principal Investigator</td>
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<tr>
<td>Location:</td>
<td>AML Enterprise Center, Pearse Street / CRANN, Main Campus</td>
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<td>Salary:</td>
<td>Appointment will be made on the appropriate point of the IUA Post-Doctorate Researcher Level 2 salary scale in line with government pay policy i.e. €37,750 - €42,394 gross per annum</td>
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<td>Closing Date:</td>
<td>12 Noon on Wednesday 31st December 2014</td>
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Post Summary

This project will use a multidisciplinary approach, whereby novel nanomaterials, existing knowledge on nano-scale processing and established expertise in device fabrication and testing will be brought together to focus on creating more efficient technologies for energy storage.

The work will involve processing of nanomaterials on large scale equipment in the Department, followed by detailed electrochemical and impedance spectroscopy, and structural characterisation using a suite of techniques including scanning and transmission electron microscopy.

Background to the Post

Professor Nicolosi leads the Characterisation & Processing of Advanced Materials Group (http://physics.tcd.ie/cpam/) within the School of Chemistry and the School of Physics. The group is devoted to the processing and electron microscopy structural characterization of low-dimensional nanostructures. Dispersability, processability and manipulation of these objects are important objectives of the group. In the group particular attention is given to the study of the material atomic structures to better understand their fundamental physical and chemical properties. The group works on a range of low-dimensional nanomaterials, such as carbon nanotubes, inorganic nanowires, graphene and other inorganic two-dimensional nano-sheets.

Standard duties of the Post

The post holder will be responsible for the liquid phase exfoliation to obtain two-dimensional nano-sheets, the development of processing methods for their use as electrode materials and their electrochemical characterization. A key aspect of this project will be the close collaboration within the team (especially with regard to nanomaterials processing and electron microscopy characterisation in order to gain a better understanding of the materials’ chemical and physical
properties) and collaboration with Professor Jonathan Coleman at the School of Physics and with an industrial partner linked to the AMBER Centre.

S/he will be expected to take on the day-to-day running of the part of the research programme under the direction of Professor Nicolosi, liaising closely with Professor Jonathan Coleman and his group for the fabrication and electrochemical characterisation of the electrodes.

The core tasks are as follows:
1. Optimisation of the liquid phase exfoliation of nanomaterials and characterization of the exfoliated material by TEM, SEM and XPS-Raman-UVVisIR spectroscopies.
2. Fabrication and electrochemical testing of electrodes. This phase of the project will focus on the investigation of different arrangements and electrode deposition techniques, such as spraying vs vacuum filtration and different electrolytes. Characterization techniques required are: Electrochemical impedance spectroscopy (EIS), galvanostatic charging/discharging, Brunauer–Emmett–Teller (BET)
3. Writing papers and giving presentations on the research conducted.
4. Helping with the day to day running of the research group, training and supervising students, procuring orders, managing the laboratories.

Funding
Funding for this post is provided by a collaborative industrial programme under the SFI funded Advanced Materials and Bio Engineering Research Centre (AMBER).

Person Specification

Qualifications
- A PhD in Materials Science, Physics, Chemistry or a related discipline. (Essential).

Essential Knowledge and/or Experience:
- Significant practical experience, good knowledge of the theory behind and proven ability in at least one of the following areas:
  (i) Liquid-phase synthesis of inorganic nanomaterials by chimie douce.
  (ii) Electrochemical characterization: impedance spectroscopy (EIS) and galvanostatic charging/discharging.
- Demonstrable expertise in sample preparation and routine techniques for characterization such as TEM, SEM, XPS-Raman-UVVisIR spectroscopies.
- Proven knowledge of chemistry and electrochemistry at a minimum level commensurate with a Master's degree.
- Well-organised and self-motivated with the ability to manage the day-to-day running of a research project, to identify research objectives and to carry out appropriate research activities within a given timescale.
- Excellent oral and communication skills, including the proven ability to write in English at a suitable standard for the preparation of written reports, publications and presentations of the work at generalist and specialist levels, including discussions with engineers and scientists in different fields.
• Willingness to travel to collaborators across Europe and to conferences to disseminate results.

Desirable Knowledge and/or Experience:
• A strong publication record in internationally peer-reviewed journals
• Experience of working with industrial collaborators.
• Experience in the training and supervision of junior researchers.

Further Information for Candidates

For additional details on these research positions please contact:
Jesus Barco Montero
CRANN
Trinity College Dublin
barcomoj@tcd.ie

URL Link to Institute  http://www.crann.tcd.ie
URL Link to Research Group  http://physics.tcd.ie/cpam/

Trinity College Dublin

Founded in 1592, Trinity is at the nexus of tradition and innovation, offering undergraduate and postgraduate programmes across 24 schools and three faculties: arts, humanities, and social sciences; engineering, maths and science; and health sciences. Spread across 47 acres in Dublin’s city centre, Trinity’s 17,000-strong student body comes from all 32 counties of Ireland, and 16% of students come from outside the country. Of those, 40% are from outside the European Union, making Trinity’s campus cosmopolitan and bustling, with a focus on diversity.

As Ireland’s leading university, the pursuit of academic excellence through research and scholarship is at the heart of the Trinity education. Trinity is known for intellectual rigour, excellence, interdisciplinarity, and research-led teaching. Home to Nobel prize-winners such as scientist Ernest Walton and writer Samuel Beckett, Trinity draws visitors from across the world to its historic campus each year, including to the Book of Kells and Science Gallery which capture the university’s connection to both old and new.

Trinity accounts for one-fifth of all spin-out companies from Irish higher education institutions, helping to turn Ireland into an innovation-intensive, high-productivity economy. That culture of innovation and entrepreneurship is a defining characteristic of our campus as we help shape the next generation of job creators.

Trinity has developed significant strength in a broad range of research areas, including the 19 broadly based multi-disciplinary thematic research areas.
Ireland’s first purpose-built nanoscience research institute, CRANN, houses 150 scientists, technicians and graduate students in specialised laboratory facilities. Meanwhile, the state-of-the-art Biomedical Sciences Institute is carrying out breakthrough research in areas such as immunology, cancer and medical devices.

The Old Library, which houses the Long Room, in Trinity is the largest research library in Ireland, with a collection of six million printed items, 500,000 maps, 80,000 electronic journals, and 350,000 electronic books. Some of the world’s most famous scholars are graduates of Trinity, including writer Jonathan Swift, dramatist Oscar Wilde, philosopher George Berkeley, and political philosopher, and political theorist Edmund Burke. Three Trinity graduates have become Presidents of Ireland - Douglas Hyde, Mary Robinson and Mary McAleese.

Trinity is the highest ranked university in Ireland, and among the world’s leading higher education institutions.

**Pension Entitlements**

This is a pensionable position and the provisions of the Public Service Superannuation (Miscellaneous Provisions) Act 2004 will apply in relation to retirement age for pension purposes. Details of the relevant Pension Scheme will be provided to the successful applicant.

Applicants should note that they will be required to complete a Pre-Employment Declaration to confirm whether or not they have previously availed of an Irish Public Service Scheme of incentivised early retirement or enhanced redundancy payment. Applicants will also be required to declare any entitlements to a Public Service pension benefit (in payment or preserved) from any other Irish Public Service employment.
Applicants formerly employed by the Irish Public Service that may previously have availed of an Irish Public Service Scheme of Incentivised early retirement or enhanced redundancy payment should ensure that they are not precluded from re-engagement in the Irish Public Service under the terms of such Schemes. Such queries should be directed to an applicant’s former Irish Public Service Employer in the first instance.

**Equal Opportunities Policy**

Trinity College Dublin is an equal opportunities employer and is committed to the employment policies, procedures and practices which do not discriminate on grounds such as gender, civil status, family status, age, disability, race, religious belief, sexual orientation or membership of the travelling community.

**Application Procedure**

Candidates should submit a cover letter together with a full curriculum vitae to include the names and contact details of 3 referees (email addresses if possible) to:

Name: Mr. Jesus Barco Montero  
Title: Research Assistant  
Email Address: barcomoj@tcd.ie  
Address: CRANN  
            Trinity College Dublin  
            Dublin 2  
            Ireland

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