Please complete and submit to uccresearch@ucc.ie and copy l.brett@ucc.ie by 30 November 2012 to allow the website to be generated.

<table>
<thead>
<tr>
<th><strong>Project title</strong></th>
<th>Pricing and Hedging based on 2EPT Levy processes</th>
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<tbody>
<tr>
<td><strong>Supervisor name and contact details</strong></td>
<td>Professor Bernard Hanzon,&lt;br&gt;Department of Mathematics,&lt;br&gt;School of Mathematical Sciences,&lt;br&gt;Western Road,&lt;br&gt;University College Cork&lt;br&gt;<a href="mailto:b.hanzon@ucc.ie">b.hanzon@ucc.ie</a></td>
</tr>
<tr>
<td><strong>Supervisor/group web-page</strong></td>
<td><a href="http://www.edgeworth.biz">www.edgeworth.biz</a>&lt;br&gt;<a href="http://publish.ucc.ie/researchprofiles/D019/bhanzon">http://publish.ucc.ie/researchprofiles/D019/bhanzon</a></td>
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<td><strong>Project description (100-200 words)</strong></td>
<td>Recently progress has been made in describing Levy processes which have the property that for a well-chosen time step length the corresponding discrete time process has rational characteristic functions. These are the so-called 2-EPT Levy processes. In this project we want to compare pricing and hedging methods based on 2-EPT Levy processes with those based on well-known Levy processes in the literature such as Variance Gamma (which is an example of a 2-EPT Levy process), CYMG, classical GBM (Geometric Brownian Motion) etc. A number of questions that arise are: Can we get results of at least the same quality as the other methods by using a high order 2EPT density? Can we improve on the existing methods due to greater flexibility in the 2EPT approach? What is the hedging risk</td>
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involved? Can the hedging risk be reduced by bringing in vanilla options as additional underlyings? In the project we also want to look at computational aspects of using 2EPT Levy processes in finance such as PIDE (partial integral-differential equations) methods and possibly tree methods. Also other applications of 2EPT processes in financial and insurance mathematics can be considered.

<table>
<thead>
<tr>
<th>Description of facilities and research environment</th>
<th>Work will take place in the Edgeworth Centre for Financial Mathematics and the Department of Mathematics at the School of Mathematical Sciences, UCC.</th>
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<tr>
<td>Match with Science without Borders priority area(s)*</td>
<td>Mathematics</td>
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*These are the priority areas under this initiative
  - Engineering;
  - Physical Sciences: Mathematics, Physics, Chemistry, Biology and Geosciences;
  - Clinical, Pré-clinical and Health Sciences;
  - Computing and Information Technology;
  - Aerospace Technology;
  - Pharmaceuticals;
  - Sustainable Agricultural Production;
  - Oil, Gas and Coal;
  - Renewable Energy;
  - Minerals Technology;
  - Biotechnology;
  - Nanotechnology and New Materials;
  - Technologies for Prevention and Mitigation of Natural Disasters;
  - Bioprospecting and Biodiversity;
  - Marine Sciences;
  - Creative Industry;
  - New Technologies Construction Engineering.