

# THE AWARDS 2021

## Research Project of the Year: STEM

<b>Institution name</b>	University of Manchester
<b>Submission title or project name</b>	The Invention of Molecular Weaving – Making the World’s Finest Fabrics
<b>Nominee/key personnel</b>	Dr Leoni I. Palmer; Dr David P. August; Dr Zheling Li; Ms Paige R. C. Kent; Dr Yiwei Song; Dr George F. S. Whitehead; Dr Christopher A. Muryn; Dr Jean-François Lemonnier; Prof. Sarah J. Haigh; Prof. Robert A. W. Dryfe; Prof. Robert J. Young; Prof. David A. Leigh
<b>URL</b>	<a href="http://www.catenane.net/pages/2020_2D_Material.html">http://www.catenane.net/pages/2020_2D_Material.html</a>
<b>Submission</b>	<p>Scientists from the University of Manchester have invented a way to weave molecular strands, creating the finest woven fabric ever produced. Each layer of the fabric is just 4 nanometres thick – 10,000x thinner than a human hair.</p> <p>The team used metal atoms and negatively charged ions that work in tandem to form sheets of woven molecular strands. The molecularly-woven material has a thread count of 40-60 million strands per inch (~7.7 million strands per cm<sup>2</sup>), compared to 1500 for the finest Egyptian linen, and holds the world record for the ‘Finest Woven Fabric’ (<a href="https://www.guinnessworldrecords.com/world-records/640347-finest-woven-fabric">https://www.guinnessworldrecords.com/world-records/640347-finest-woven-fabric</a>).</p> <p>The fabric has remarkable properties: it is twice as strong as the unwoven strands and behaves like a molecular net. It opens the way for lighter, stronger and more sustainable fabrics (less material is needed), and ‘molecular filters’ that let water and oxygen through but block larger particles such as viruses.</p>