

# 30<sup>th</sup> Annual Cork Mechanical, Manufacturing & Biomedical Engineering Exhibition



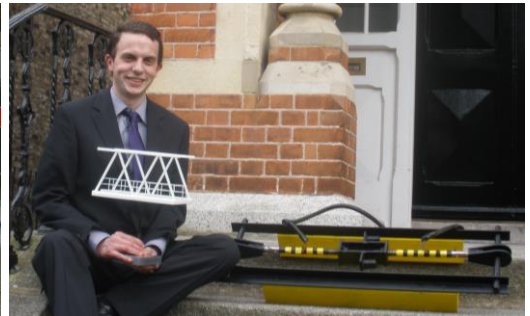
*Engineers Ireland “Best in Class”  
Education Excellence Award Winner*



*200 Stands in Total in 2016 Event*

*Thursday April 28<sup>th</sup> 2016*

*Nexus Courtyard, Student Centre, Cork Institute of Technology*



*Design, Innovation and Ethical Engineering*

*2016 Exhibition Theme*

*30 Year A Growing!*

*Ireland and Europe’s*

*Largest Educational Engineering Event*

*CIT Engineering Innovation and Entrepreneurship*

*Thursday April 28<sup>th</sup> 2.00 p.m. to 8.30 p.m. Admission Free*

*Venue: Nexus Courtyard, Student Centre, Cork  
Institute of Technology*



*For more details, please contact Exhibition Organiser:  
Senior Lecturer Sean F. O’Leary, School of Mechanical, Process & Electrical Engineering  
Tel: (021) 4335425 Email: seanf.oleary@cit.ie*



No.	Title of Stand	Industrial Partner
Centre Piece Stand	<b>30 Year A Growing! Ireland and Europe's Largest Educational Engineering Event CIT Engineering Innovation and Entrepreneurship</b>	<i>Engineers Ireland Excellence Awards 2015 Intercontinental Hotel, Dublin Engineering Education Excellence "Best in Class" Award 2015</i>
Centre Piece Stand	<b>CIT Engineering International / National Achievements</b>	Centrepiece Exhibit 2
Stand 1	<b>Cork Institute of Technology 'Engineering an Innovation Eco-System' Irish National Award Winner</b>	<i>European Commission Award 2015 "Promoting the Entrepreneurial Spirit" European Enterprise Promotion Awards November 2015 Luxembourg</i>
Stand 2	<b>"Design and Development of an Assistive Technology Music System for People with Cerebral Palsy" James Fogarty Biomedical Engineering Cork Institute of Technology</b>	<i>International Medical Engineering Finals Westminster London 2015 Vicon Prize for Best Undergraduate Medical Engineering Project 2015 First Place and Outright Winner</i>
Stand 3	<b>"Equaliser<sup>TM</sup> - Extreme Weather Conditions Novel Tie-down System for Ship to Shore Cranes" Brian Hand and Ronan Hand Mechanical Engineering and Sustainable Energy Cork Institute of Technology</b>	<i>University Startup World Cup Finals Copenhagen Denmark 2015 Top Three Worldwide Product and Technology Category</i>
Stand 4	<b>"Advanced Hydro Systems - Design and Development of an Automatic Flood Barrier" Damien Dennehy Mechanical Engineering Cork Institute of Technology</b>	<i>The Chartered Institution of Water and Environmental Management Sligo 2015 AECOM Student Environmental National Award Winner 2015</i>
Stand 5	<b>"Piglet Mortality Reduction Automatic Pig Milking Device Design and Development" Ms. Emma O'Leary, Ms. Nicolle Dunphy and Ms. Kelly Lane Biomedical Engineering Cork Institute of Technology</b>	<i>Engineers Ireland Innovative Student Engineer of the Year 2015 EI HQ, Ballsbridge, Dublin 2015 National Competition Finalist Award</i>
Stand 6	<b>"Design and Development of a Fast Scan System" in conjunction with EMC Michael Harrington Mechanical Engineering Cork Institute of Technology</b>	<i>MEETA - Asset Managers Association EI HQ, Ballsbridge, Dublin National Student Certificate of Excellence Award 2015</i>
Stand 7	<b>"Preventive Maintenance Optimization of a Split Mold Stent Security Machine" Kevin Condon Biomedical Engineering Cork Institute of Technology</b>	<i>MEETA - Asset Managers Association EI HQ, Ballsbridge, Dublin National Student Certificate of Excellence Award 2015</i>
Stand 8	<b>"PyraAid<sup>TM</sup> Wheelchair Enablement Device Design and Development" John Roberts Mechanical Engineering Cork Institute of Technology</b>	<i>European Student Innovation Awards Innovact 2014 Reims France European Campus Student Innovator of the Year 2014 First Place and Outright Winner</i>
Stand 9	<b>"Drone Compatible Medical Transportation Pod Design, Development and Testing" James King Mechanical Engineering Cork Institute of Technology</b>	<i>Engineers Ireland Innovative Student Engineer of the Year 2014 Level 8 National Award sponsored by Siemens First Place and Outright Winner</i>
10.	CardiEq <sup>TM</sup> Equine Training Device Design	Multi-Discipline Start-Up Innovation Team
11.	Steady Life <sup>TM</sup> Medical Enablement Device Design	Multi-Discipline Start-Up Innovation Team
12.	Easy Gate <sup>TM</sup> Infant Safety System Design	Multi-Discipline Start-Up Innovation Team
13.	H-FLO <sup>TM</sup> Platform Safety System Design	Multi-Discipline Start-Up Innovation Team
14.	Bull Stop <sup>TM</sup> Agricultural Safety System Design	Multi-Discipline Start-Up Innovation Team
15.	RSL <sup>TM</sup> Sport Application Medical Device Design	Multi-Discipline Start-Up Innovation Team
16.	Shelve Tech <sup>TM</sup> Safe and Efficient Storage Device Design	Multi-Discipline Start-Up Innovation Team
17.	A <sub>3</sub> CL <sup>TM</sup> Medical Recovery Device Design	Multi-Discipline Start-Up Innovation Team
18.	Bafety <sup>TM</sup> Transport Safety Device Design	Multi-Discipline Start-Up Innovation Team

<b>Stand 20</b>	<b><i>Bachelor of Engineering (Honours) in Mechanical Engineering International / National Achievements</i></b>	<b>Centrepiece Exhibit 3 <i>Think Outside the Box CIT Engineering Innovation and Entrepreneurship</i></b>
21.	Surgery Cutting Tip Design and Material Investigation	Stryker Instruments
22.	Optimisation of Ice Banks using Nano Particles and Agitators	Research and Development
23.	Construction Sector Novel Safety Device Mechanism Design and Development	Start-Up Innovation Project
24.	Performance Analysis of Crane Hoisting System	Liebherr
25.	Softmotion Control System Design and Development	Research and Development
26.	Fluid-Structure Interaction model of Vertical Axis Wind Turbine	MeSSO Research Group
27.	Smart Robot for Vacuum Floor Cleaner Design and Development	Research and Development
28.	Integration Process Improvement	EMC
29.	Failure Investigation and Redesign of Mixing Impeller	Research and Development
30.	Process Steam Optimisation for Biopharmaceutical Industries	Biomarin International
31.	Analysis of Piping Failure and Design Solution	Research and Development
32.	A Laboratory and Numerical Investigation of Parallel Flow through a Slotted Cavity	MeSSO Research Group
33.	Temperature Profiling Device for Drying Conveyors Mechanism Design and Development	Research and Development
34.	Mobile Ration Feeder Design and Development	EMC
35.	High Pressure Chromatography Column Investigation	Research and Development
36.	"Clubman" Motorsports Roll Cage Side Impact and Support Structure Optimised Design, Development and Validation	Research and Development
37.	Investigation of Splay Defect due to Laser Cutting	Research and Development
38.	Milling Optimisation using a CNC Post-Processor	Research and Development
39.	Air Handling Unit Model Development	Research and Development
40.	Offshore Vertical Axis Wind Turbine Optimisation	Research and Development
41.	Investigation of Nylon Insulating Foam	Research and Development
<b>Stand 42</b>	<b><i>Bachelor of Engineering (Honours) in Biomedical Engineering</i></b>	<b>Centrepiece Exhibit 4</b>
<b>Stand 43</b>	<b><i>Medical Engineering Design and Innovation Centre (MEDIC) – Cork Institute of Technology Enterprise Ireland Applied Research Enhancement Centre</i></b>	<b>Centrepiece Exhibit 5</b>
44.	Biomedical Cement Adhesion Properties Investigation as applied to Variations in the Surface Roughness of Tibial Trays	DePuy Ireland
45.	Nebuliser Monitoring	Research and Development
46.	Capacitive Sensor for Monitoring Moisture in Fabrics	NIMBUS
47.	Hurling Helmet Face Protector Testing and Design Modification of Ear Guards	Research and Development
48.	Medical Device Accessories (ECG leads) Failure Investigation and Redesign	HSE
49.	Heart and Respiration Rate Monitoring of Sportsmen Post Activity to Detect Asthmatic Signs	Research and Development
50.	Insole Pressure Monitor Prototype for People with Diabetes Design, Development and Validation	NIMBUS
51.	Novel 3D Printing Process using Liquid PVC Plastisol to print 3-Dimensional Biomedical Parts in Soft PVC	Research and Development
52.	Packaging Process Optimisation	Wright Medical
53.	Micro-Needle Stress Analysis / Optimisation	Research and Development
54.	In Bed Patient Movement Monitor Design and Development	NIMBUS
55.	Rigid Head Mount Unit for Impact Testing of Hurling Helmets Design and Development	Research and Development
56.	Dynamic Analysis of a Machine Tool using NX	DePuy Ireland
57.	SitRight Backrest Optimisation	Research and Development
58.	Drop Tester for Hurling Helmet Testing Design and Development	NSAI-CIT
59.	Micro-Needle Manufacture	Research and Development
60.	3D Printing	DePuy Ireland

No.	Title of Stand	Industrial Partner
61.	Surgical Drape Support and Oxygen Supply Device Design and Development	Cork University Hospital
62.	Bionic Arm Arduino Control Design and Development	Research and Development
63.	Non-Invasive Dehydration Measurement Device Design and Development	NIMBUS
64.	Tablet Manufacture	Research and Development
65.	Method of Micro-Needle Manufacture through Material Deposition and Thermal Drawing	Research and Development
<b>Stand 66</b>	<b><i>Bachelor of Engineering (Honours) in Chemical and Biopharmaceutical Engineering</i></b>	<b>Centrepiece Exhibit 6</b>
67.	Plug Flow Reactor Development	Eli Lilly
68.	Microfluidic Platform for Controlled Processing of Polymeric Drug Delivery Systems	Research and Development
69.	Methods of Reducing Product Drying Time Investigation	Roche Ireland
70.	Tangential Flow Filtration Investigation	Research and Development
71.	Process Hazard Review of Product X Stage 4	GlaxoSmithKline Cork
72.	Packed Bed Reactor for Continuous Operation Utilization	Research and Development
73.	Tolhurst Centrifuge Cleaning Assessment for CIP Use	MSD Ballydine
74.	Crystallisation Unit Development	Research and Development
75.	Risk Assessment Procedures at Roche Clarecastle Simplification	Roche Ireland
76.	Anaerobic Digestion and Pyrolysis Processes Critical Evaluation	Response
77.	Evaluation of the Impact of Pulp B in the Production of MCC	FMC
78.	Filtration Investigation	MSD Ballydine
<b>Stand 79.</b>	<b><i>Centre for Advanced Manufacturing and Management Systems (CAMMS)</i></b>	<b>Centrepiece Exhibit 7</b>
<b>Stand 80.</b>	<b><i>Bachelor of Engineering in Mechanical Engineering Level 7</i></b>	<b>Centrepiece Exhibit 8</b>
81.	Rowing Boat Storage / Lift Design and Development	Research and Development
82.	Road Bump Energy Harness Design and Development	Research and Development
83.	Motorbike Swinging Arm Design and Development	Research and Development
84.	Lime / Sawdust Mixer Design and Development	Research and Development
85.	Cam Clearance Tool Design and Development	CIT Engine Development Centre
86.	Trough Feeder Design and Development	Research and Development
87.	Grease Primer Design and Development	Research and Development
88.	Solar Tower Development	Research and Development
89.	Robot Hand Design and Development	Research and Development
90.	Advanced Robot Programming	Research and Development
91.	Variable Inlet Design	CIT Engine Development Centre
92.	Skip Loader Design and Development	Research and Development
93.	Weight Lifting Safety Device Design and Development	Research and Development
94.	Computer Numerically Controlled Machine CNC Refit	Research and Development
95.	First Person View FPV Helmet Design and Development	Research and Development
96.	Kart Lift System Design and Development	Research and Development
97.	Horse Riding Simulator Mechanism Design and Development	Gateway Equestrian
98.	Knee Hydrotherapy Device Design and Development	Research and Development
<b>Stand 99.</b>	<b><i>Bachelor of Engineering in Biomedical Engineering Level 7</i></b>	<b>Centrepiece Exhibit 9</b>
100.	Deep Vein Thrombosis Device Design and Development	Research and Development
101.	Carpal Tunnell Syndrome Glove Design and Development	Research and Development
102.	Water Purifier Device Design and Development	Research and Development
103.	Dialyser Test Rig Design and Development	Research and Development
104.	Inversion Table Design and Development	Research and Development

<b>Stand 105</b>	<b><i>Bachelor of Science in Advanced Manufacturing Technology Honours Level 8</i></b>	<b>Centrepiece Exhibit 10</b>
106.	Medication Dispenser for Clinical Applications Design and Development	Research and Development
107.	Dynamic Free Taking Training Wall Design and Development	Research and Development
108.	Domestic Water Conservation System Design and Development	Research and Development
109.	Movable Arm Aid to Patient with Limited Mobility Design and Development	Research and Development
110.	Ergonomic and Health & Safety Analysis of Production Cell	ALPS
111.	ABB Robot Cell - Pencil Sharpening Station	Research and Development
112.	ABB robot Cell - Pencil Cutting Station	Research and Development
113.	ABB Robot Cell - Inspection Station	Research and Development
114.	Recycling Domestic Foul Water Viability Investigation	Research and Development
115.	Portable Wheel Balancer Design and Development	Research and Development
116.	Tray Washer Station Design and Development	Research and Development
117.	Slurry Agitator Impeller Analysis	Research and Development
118.	Calibration Test Fixture Design and Analysis	Research and Development
119.	Bicycle Test Rig Design and Development	Research and Development
120.	Manual Workstation for Sharpening Pencils Development	Research and Development
121.	Calibration Inspection Fixture Design and Development	Research and Development
122.	Control Rig Design and Implementation	Research and Development
123.	Polymer Recycling Analysis	Research and Development
<b>Stand 124</b>	<b><i>Bachelor of Science in Process Plant Technology Honours Level 8</i></b>	<b>Centrepiece Exhibit 11</b>
125.	"Witness" Model for Process Simulation Development	Research and Development
126.	Waste Management Optimisation	GE Healthcare
127.	Automated PTO Coupling	Research and Development
128.	Electric Car Jack Design and Development	Research and Development
129.	Wheel Chair Access Platform Design and Development	Research and Development
130.	Process Rig Design and Implementation	Research and Development
131.	Heat Treatment Rig Design and Development	Research and Development
<b>Stand 132</b>	<b><i>Bachelor of Engineering in Sustainable Energy Honours Level 8</i></b>	<b>Centrepiece Exhibit 13</b>
133.	Solar PV Lighting Investigation	Port of Cork
134.	Sustainable Energy Communities with Wind Turbines	Research and Development
135.	Waste Water treatment in a Dairy Processing Industry	Carbery Group
136.	Feasibility of Solid Recovered Fuel in Ireland	Research and Development
137.	Adiabatic Cooling of Chiller Plant	Tyndall
138.	Passive Homes and Climate Change	Research and Development
139.	Boiler Control Systems	GlaxoSmithKline Cork
140.	Piezoelectric Energy Generation in a Commercial Building	Research and Development
141.	Heat Recovery from Waste Water	ABP Food Group
142.	Nuclear Energy Investigation	Research and Development
143.	Energy Assessment of the National Learning Network	National Learning Centre
144.	Energy and Waste Treatment	Research and Development
145.	Implementation of IPMVP	GE Healthcare
146.	Energy Management Systems in Pharmaceutical Plants Investigation	Research and Development
147.	Incineration with Energy Recovery	Research and Development
148.	Adiabatic Cooling versus Refrigeration	Research and Development
149.	Solar PV Investigation	Research and Development
150.	Wind Turbines for Farm Application	Research and Development
151.	Compressed Air Usage by Actuated Valves Investigation	GlaxoSmithKline Cork



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152.	Thermal Energy Supply for BioPharmaceutical Plant	Janssen Biopharmaceutical
153.	Energy Management in Irelands Leisure Centres	Research and Development
154.	Integration of CHP at a Medical Devices Company	Boston Scientific
155.	Micro Grids for Domestic Applications	Research and Development
156.	Solar PV Investigation	Research and Development
157.	Feasibility of Straw as a Sustainable Feedstock for Aerobic Digestion	Research and Development
<b>Stand 158.</b>	<b><i>PhD and Masters Degree Research Projects</i></b>	<b>Centrepiece Exhibit 14</b>
159.	A New Biomechanical Model for 3D Motion Analysis	PhD Candidate, Risam Scholarship
160.	Optimisation of Oscillating Water Column Devices using Computational Fluid Dynamics	PhD Candidate, IRCSET Scholarship
161.	Aerodynamic and Structural Optimisation of a Deep Offshore Floating Vertical Axis Wind Turbine	PhD Candidate, Risam Scholarship
162.	Overheating in Nearly Zero Energy and Passive House Dwellings in Ireland	PhD Candidate, Risam Scholarship
163.	A Field Study on Thermal Comfort Performance of a Ventilative Cooling System in a Retrofitted Low Energy Building	PhD Candidate, Risam Scholarship
164.	Energy and Cost Optimisation in the Milk Production Process	PhD Candidate, Walsh Fellowship in conjunction with Teagasc
165.	Electrical Power and Water Consumption on Irish Dairy Farms: An Exploratory Analysis	Masters Degree Candidate, IOTI Funded in conjunction with Teagasc
<b>Stand 166.</b>	<b><i>Engineers Ireland</i></b>	<b>Centrepiece Exhibit 15</b>
<b>Stand 167.</b>	<b><i>Enterprise Ireland</i></b>	<b>Centrepiece Exhibit 16</b>
<b>Stand 168.</b>	<b><i>PMD Solutions Winner of CIT Prize for Innovation 2011 CEO Mechanical Engineering Graduate Myles Murray</i></b>	<b>Centrepiece Exhibit 17 November 2015 - €4.2 Million Funding 11 further jobs at PMD Solutions</b>
169.	Abbott Vascular Ireland	Research and Development
170.	Janssen Pharmaceutical	Research and Development
<b>Stand 171</b>	<b><i>Vintage and Classic Vehicles of Yesteryear Display CIT Mizen to Malin Fund Raiser Drive for Suicide Aware</i></b>	<b>Centrepiece Exhibit 16 <i>The CIT Staff and Student Mizen to Malin Vintage Car Rally for Suicide Aware supported by MunsterRugby, raised over €17,000</i></b>
<b>Stand 172</b>	<b><i>Institution of Mechanical Engineers</i></b>	<b>Centrepiece Exhibit 17</b>
<b>Stand 173-200</b>	<b><i>International / National Awards in Engineering Innovation, Design &amp; Entrepreneurship</i></b>	<b>Centrepiece Exhibit 18</b>

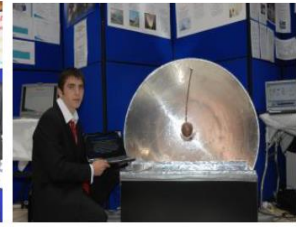






# Engineers Ireland "Best in Class" Education Excellence Award Winner 2015

**Cork Mechanical, Manufacturing and Biomedical Engineering Exhibition**  
Ireland and Europe's Largest Educational Engineering Event





**CORK INSTITUTE OF TECHNOLOGY**  
INSTITIÚID TEICNEOLAÓCHTA CHORCAÍ

## 30<sup>th</sup> Cork Mechanical, Manufacturing & Biomedical Engineering Exhibition

Thursday 28<sup>th</sup> April 2016 2.00pm – 8.30pm  
200 Stands  
Ireland and Europe's Largest Educational Engineering Event

*Exhibition Theme 2016:*  
**30 Years A Growing!**  
**CIT Engineering Innovation and Entrepreneurship**

# Engineers on the move

**Opening Time:**  
Thursday 28<sup>th</sup> April  
2.00pm to 8.30pm  
Nexus Courtyard - CIT

Admission Free

For further information and group bookings, contact:  
Sean F. O'Leary, Senior Lecturer, CIT.  
Tel. 00 353 21 4335425  
sean.foleary@cit.ie

*Design, Innovation & Ethical Engineering*





## ***International / National Awards in Engineering Innovation, Design & Entrepreneurship***

### **National Prize-Winners in**

#### **Engineering Innovation, Design & Entrepreneurship Innovative Product Development Laboratories include:**

*Two Engineers Ireland Excellence Awards - “ Best in Class ” Engineering Education Award (2015, 2011)*  
*Seven MEETA Asset Management and Maintenance National Awards ( 2015(x2), 2014, 2013(x2), 2011, 2006 )*  
*Eight Enterprise Ireland / Invest Northern Ireland National Awards of Merit ( 2015, 2013, 2012, 2010, 2009, 2008, 2007 )*  
*Eleven Engineers Ireland Innovative Student Engineer of the Year Awards sponsored by Siemens (2014 L8, 2013 L8, 2012 L8, 2011 L7, 2009 L7, 2008 L8, 2007 L7, 2006 L8, 2005 L8, 2004 L8, 2003 L8)*  
*One Chartered Institution of Water and Environmental Management - AECOM Student Environmental National Award Winner - Sligo ( 2015 )*  
*Five Enterprise Ireland I.Mech.E Speak Out for Engineering Awards ( 2014, 2013, 2007, 2006, 2004 )*  
*One CADFEM Ireland and Ansys Users Conference EI HQ Dublin Best Presentation Paper ( 2014 )*  
*Two Enterprise Ireland / Invest Northern Ireland Young Entrepreneur of the Year First Place Award ( 2013, 2007 )*  
*Four Cruickshank Most Technologically Innovative Project First Place Award ( 2013, 2009, 2008, 2007 )*  
*One GradIreland Graduate Employee of the Year First Place Award Mansion House Dublin ( 2012 )*  
*One NCBI Inclusive Technology Showcase Grand Prize Wood Quay Dublin ( 2012 )*  
*Three Abbott Ireland Intern of the Year Awards ( 2012, 2011, 2009 )*  
*Two Enterprise Ireland / Invest Northern Ireland Academic Innovation Awards ( 2012, 2009 )*  
*One Engineers Ireland Excellence Awards - ESB Award for Outstanding Contribution to Engineering (2011)*  
*One Engineers Ireland Excellence Awards - Chartered Engineer of the Year (2011)*  
*One Inaugural Enterprise Ireland / Invest Northern Ireland Young Entrepreneur of the Year Solving Problems for Industry €7,500 Award ( 2009 )*  
*Two HP Invent Awards for Best Science/Engineering/IT project in Ireland*  
*Three William Eccles Institution of Production Engineers National Awards*

### **International Prize-Winners in**

#### **Engineering Innovation, Design & Entrepreneurship Innovative Product Development Laboratories include:**

*Nine First Places and Seven Runner Up Finalists in the Institution of Mechanical Engineers Best Medical Engineering and Design and Development of a Biomedical Device Competitions, London ( 2015, 2014, 2011, 2010, 2008, 2007, 2006, 2005 )*  
*Two European Laureate of Innovation First Place Award - European Student Innovator of the Year 2014 and 2012 - European Student Innovation Finals - Innovact Reims France ( 2014, 2012 )*  
*One University Startup World Cup Finals Sole Irish Finalist Category Finalist Award Winner Copenhagen Denmark (2015)*  
*European Science Engineering and Technology Best European Mechanical Engineering Student One First Place and One Runner Up Babcock Award - SET Finals London UK ( 2013, 2011 )*  
*Two Enterprise Ireland / Invest Northern Ireland Think Outside the Box Academic Innovation Awards ( 2012, 2009 )*  
*One European Laureate of Innovation Third Place Award – European Student Innovation Finals - Innovact Reims ( 2010 )*  
*Two Gold Medals Undergraduate Awards of Ireland and Northern Ireland Engineering/Mechanical Sciences ( 2011, 2010 )*  
*Seven First Places and Six Runner Up Finalists in the Institution of Mechanical Engineers Best Medical Engineering and Design and Development of a Biomedical Device Competitions, London ( 2011, 2010, 2008, 2007, 2006, 2005 )*  
*One Global Student Entrepreneur Finalist Award sponsored by the Entrepreneurs’ Organisation in conjunction with Mercedes-Benz Financial at the GSEA Finals in Kansas City, Missouri, USA ( 2009 )*  
*One SOFE Paris Second Place Award - Institution of Mechanical Engineers ( 2009 )*  
*One First and One Second Place in the ISEA International Sports Engineering Competition, London*  
*Two Queen’s Silver Jubilee awards for Best Mechanical Engineering Degree Project in Ireland and Britain*  
*One Genius 2000 Award for Best New Invention at the Nuremburg Inventors’ Fair*  
*Two Society of Manufacturing Engineering Outstanding Young Engineer Worldwide Awards*  
*Three First Places for Best Published and Presented Paper at the International Manufacturing Conference.*

## ***Engineering an Innovation Eco-System***

