TSSR

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Inquiries at trinssr@tcd.ie

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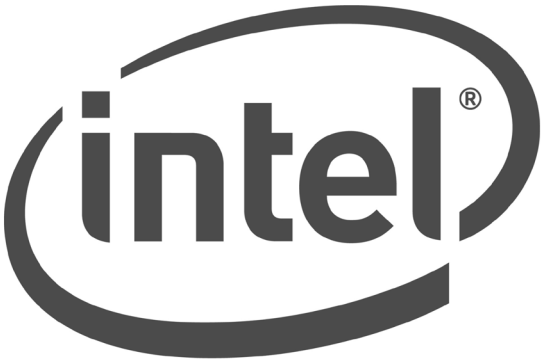

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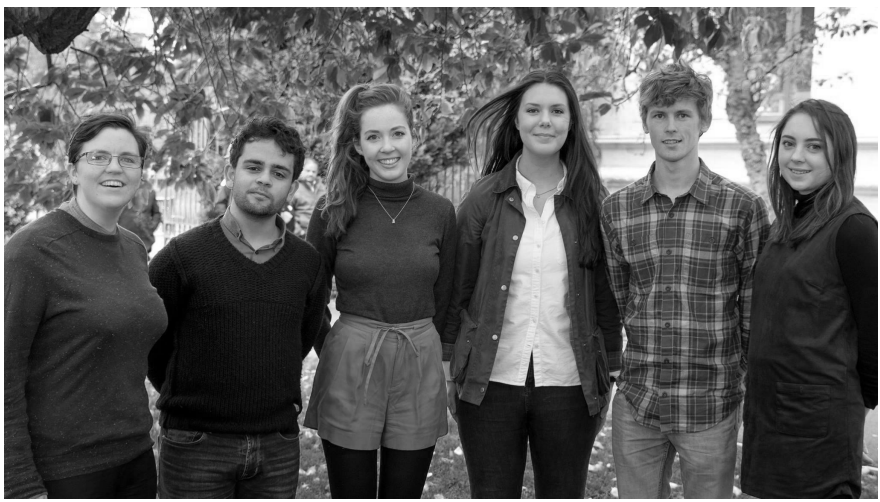

From Left to Right:
Amy Worrall, Blaise Delaney, Kate Reidy, Sarah Deegan, James Orr, Alison Hennessy

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Best Overall Essay:
Elongation, Termination and Antitermination: the Final Stages of Transcription in *Escherichia coli*
Kevin Lyons

Best Life Sciences Essay:
Inhibitor of Apoptosis Proteins and Their Potential in Cancer Therapy
Karen Slattery

Best Animal, Plant and Earth Sciences Essay:
Deafenaing Silence: The Impact of Naval Sonar Activity on Cetaceans
Andrew Mooney

Best Chemistry Essay:
Climate Change Mitigation using Metal-Organic Frameworks for Direct Air Capture of CO_2
Dónal Ring

Best Physics Essay:
The Nuclear Option: Advanced Radiotherapy Techniques for Cancer Treatment
Oskar Ronan

Best Freshman Essay:
Prebiotic Chemistry: Common Origins of Glycerol, Amino Acids, and Pyrimidines, and Cosmic Origin of Nature's Enantiomeric Excess of Amino Acids
Stephen Byrne

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Life Sciences

Animal, Plant and Earth Sciences

Chemistry

Physics

Welcome

Dear Reader,

2016 has seen one of the largest scientific breakthroughs of our generation. Decades in the making, the detection of gravitational waves is a discovery of paramount importance. Einstein first proposed their existence in his 1916 Theory of General Relativity. Their detection, coming 100 years later, is the embodiment of perseverance, ingenuity, and dedication of scientists worldwide to an idea. This is but one example of how scientific research in the last century has allowed us to push the boundaries of our knowledge and question the nature of the entire world around us.

Here at the TSSR we endeavour to provide undergraduates with a platform where they can begin to pose their own questions and perform their own investigations.

Undergraduate research has a long history in Trinity College Dublin. Dr. William Campbell, Nobel laureate and graduate of the college, first became interested in his field of research, parasitic worms, as an undergraduate in Trinity in the early 1950's. It was in the late 1970's that his team made the discovery of the drug avermectin and, almost 65 years after he first began his research, he was awarded the Nobel Prize in Physiology or Medicine in 2015. Dr. Campbell is a shining example of perseverance and should be remembered as an inspiration to all students as they begin their scientific careers. His undergraduate research was an important stepping stone in the future direction of his career and we hope to set that example and engage current Trinity students to see that their work now has the potential to lead to greater successes in the future.

Founded in 2015 by a group of pioneering undergraduates, the TSSR became the first peer-reviewed undergraduate scientific review journal of its kind in Ireland. It was created with the aim of showcasing student research, increasing awareness of scientific publication, and demonstrating the level of work done by students, to readers both inside and outside the college community. To the founding team I must extend a sincere gratitude. Without their initiative and passion the TSSR would not exist today.

The multidisciplinary nature of the TSSR is a key facet of the journal and one of its greatest strengths. This year we were inspired by the exceptional scientific writing put forward by undergraduates, with submissions spanning a wide range of scientific disciplines, from climate change, to quantum encryption, to name but a few. We hope this diversity will allow you, the reader, to sample the burgeoning talent within Trinity College Dublin,to kindle your curiosity, and inspire you to delve deep into the boundless world of scientific research.

Volume 2 would not exist without the help, advice, and hard work of many individuals and to them all I am incredibly grateful.

To every student who submitted to the journal, we are sincerely grateful for all the hard work you put into your pieces. We were blown away by your exceptional talent and, regardless of whether you made the final publication or not, we hope you benefited and learned from this experience.

To all our Academic Advisors, PhDs, Assistant Editors and anyone who has lent an ear to my questions throughout the year, your faithful support and advice has been thoroughly appreciated. To our sponsors who have gratefully supported us this year: Intel, Identigen, NSilico, TCD Association and Trust, and The Science Gallery, we are sincerely grateful.

To Prof. Vinny Cahill, Dean of the Faculty of Engineering, Mathematics and Science, and everyone in the Faculty office, we wholeheartedly thank you for all your support and advice throughout the year, without which we would not be here today.

My final thank you must be to my wonderful Editorial Board and Committee. Amy Worrall, Sarah Deegan, Kate Reidy, Blaise Delaney and James Orr, you have done amazing work these past few months and it has been an absolute pleasure to be able to call you both esteemed colleagues and friends.

With that, on behalf of myself, the Editorial Board and Committee, I welcome you to Volume 2.

Alison Hennessy
General Manager
Trinity Student Scientific Review 2015/16