

"The most exciting phrase to hear in science, the one that heralds the most discoveries, is not 'Eureka!', but "That's funny..." "
- Isaac Asimov

FOREWORD

Dear Reader,

Scientific research is ultimately a venture into the unknown, with the goal of understanding all that surrounds us. To achieve this, passion, hard-work, and persistence are required. However, the truly remarkable thing about science is that anyone who has these qualities can help make progress in pushing the boundaries of the collective knowledge of humanity.

Since 2015, the SFU Science Undergraduate Research Journal (SURJ) has aimed to foster a community to help budding undergraduate researchers flourish, by providing many opportunities to showcase their work. Initially, and chiefly, this has been done through the publication of manuscripts written by undergraduate researchers at SFU, which have gone through a rigorous peer review process facilitated by SURJ. On top of the publication of the journal which caters to a more niche crowd, we have expanded to also run a blog which makes the research at SFU, and those who conduct it, more accessible to a general audience. One of our most successful and popular endeavours is our undergraduate research poster competition, where anyone can come and see some of the finest undergraduate research being done at SFU.

The many hours of physical, mental, and emotional work which go into a manuscript are something we at SURJ truly appreciate and understand. Each year we see many remarkable efforts and submissions that humble and motivate us. It is thus with great fervour that we work with authors, editors, and reviewers in the peer review process to prepare submissions for publication. When we look back at all we have accomplished, we are truly thankful to all the authors, peer reviewers, and editors past and present. We are also tremendously grateful to our sponsors – the Faculties of Science, Environment, and Health Sciences as well as the Chemical Institute of Canada – for their continued support. With much excitement and delight, we look forward to the future of the journal in the years to come.

Without further ado, we present to you, the fourth edition of the SFU Science Undergraduate Research Journal.

Sincerely,

Emily Leung, Olivia Tsai, Siobhan Ennis, and Anish Verma

Executive Editors