

PROCEEDINGS
of the
Research Experiences for Undergraduates
Program in Mathematics

Oregon State University
Summer 2004

Dennis J. Garity, Director

This volume contains the Proceedings of the Research Experiences for Undergraduates Program held at the Mathematics Department of Oregon State University during the summer of 2004. This program was funded by the National Science Foundation and by Oregon State University. The Provost's Office, the Research Office, the College of Engineering, the College of Science, the Mathematics Department and the Computer Science Department provided the funding from Oregon State University. Dennis J. Garity of the Mathematics Department directed the program and was a faculty advisor on research projects. Juha Pohjanpelto of the Mathematics Department and Paul Cull of the Computer Science were also faculty advisors on the research projects undertaken by the student participants. There were ten undergraduate participants in the program. The papers summarizing the research projects are listed below. The participants were:

Robin Baur.....	Harvey Mudd	Jennifer Biermann.....	Lawrence University
Frank Chemotti.....	Davidson College	Jonathan Dent.....	Calvin College
Sam Ganzfried.....	Harvard University	Jessica Kincaid.....	Oregon State University
Kathleen King.....	Olon College of Engineering	Andrea Rau.....	St. Olaf College
Pamela Russell.....	University of Pennsylvania	Scott Weaver.....	Oregon State University

Table of Contents

Robin Baur	(Advisor: Juha Pohjanpelto)	
<i>Regular Homotopy Classes of Curves on the Torus</i>		1
Jennifer Biermann and Jonathan Dent	(Advisor: Juha Pohjanpelto)	
<i>Nonnegative Defect</i>		13
Frank Chemotti and Andrea Rau	(Advisor: Dennis Garity)	
<i>Intersection Numbers of Closed Curves on the Punctured Torus</i>		30
Sam Ganzfried	(Advisor: Paul Cull)	
<i>A Simple Algorithm for Knight's Tours</i>		63
Jessica Kincaid	(Advisor: Paul Cull)	
<i>A Graphical Exploration of Stable Characteristics of Simple Population Models</i>		91
Kathleen King	(Advisor: Paul Cull)	
<i>A New Puzzle Based on the SF Labelling of Iterated Complete Graphs</i>		142
Pamela Russell	(Advisor: Paul Cull)	
<i>Perfect One-Error-Correcting Codes on Iterated Complete Graph:</i> <i>Encoding and Decoding for the SF Labelling</i>		162
Scott Weaver	(Advisor: Dennis Garity)	
<i>Special Classes of Whitehead Automorphisms on the Free Group</i>		197