

## Contents

|                                                                                                                      |     |
|----------------------------------------------------------------------------------------------------------------------|-----|
| Preface                                                                                                              | vii |
| ( $\mathrm{GL}_k \times \mathbb{S}_n$ )-modules of multivariate diagonal harmonics<br>FRANÇOIS BERGERON              | 1   |
| Some open problems on Coxeter groups and unimodality<br>FRANCESCO BRENTI                                             | 23  |
| Some combinatorial problems arising in the dimer model<br>RICHARD KENYON                                             | 39  |
| A positivity conjecture on the structure constants of shifted Jack functions<br>PER ALEXANDERSSON and VALENTIN FERAY | 51  |
| Complexity and asymptotics of structure constants<br>GRETA PANOVA                                                    | 61  |
| Increasing subsequences and Kronecker coefficients<br>JONATHAN NOVAK and BRENDON RHOADES                             | 87  |
| Combinatorics and braid varieties<br>NATHAN WILLIAMS                                                                 | 93  |
| Neighborly spheres and transversal numbers<br>ISABELLA NOVIK and HAILUN ZHENG                                        | 113 |
| Realizing simplicial complexes as the boundary of the totally non-negative part of a variety<br>HUGH THOMAS          | 129 |
| Order polynomial product formulas and poset dynamics<br>SAM HOPKINS                                                  | 135 |
| An invitation to positive geometries<br>THOMAS LAM                                                                   | 159 |
| An upper bound problem for triangulations of manifolds<br>SATOSHI MURAI                                              | 181 |
| What is a combinatorial interpretation?<br>IGOR PAK                                                                  | 191 |
| Trimer covers in the triangular grid: Twenty mostly open problems<br>JAMES PROPP                                     | 261 |

|                                                                                        |     |
|----------------------------------------------------------------------------------------|-----|
| The mystery of plethysm coefficients                                                   |     |
| LAURA COLMENAREJO, ROSA ORELLANA, FRANCO SALIOLA, ANNE<br>SCHILLING, and MIKE ZABROCKI | 275 |
| Problems in the enumeration of tilings                                                 |     |
| TRI LAI                                                                                | 293 |
| Some questions arising from the study of cohomology on flag varieties                  |     |
| ZHAO GAO, CLAUDIU RAICU, and KELLER VANDEBOGERT                                        | 333 |
| Castelnuovo-Mumford regularity and Schubert geometry                                   |     |
| ALEXANDER YONG                                                                         | 349 |
| Perfect matching problems in cluster algebras and number theory                        |     |
| RALF SCHIFFLER                                                                         | 361 |