

Preface

Astronomy and astrophysics are fields that are undergoing tremendous growth as a consequence of three decades of scientific, technological, and instrumental breakthroughs. Canadian astronomers have made key contributions to the golden age of astronomy that is now upon us.

The coming two decades will see the development of new types of observatories both on the ground and in space that will catapult to new levels, our knowledge of everything from the formation of planetary systems, stars, and galaxies, to the structure of the universe itself. Our investment in this truly exciting age of cosmic exploration will have benefits for many areas of fundamental astronomical and scientific research, public education and culture, and technological and industrial development. More than ever, a process to develop a unified vision for the new astronomical research facilities over the next 10-15 years is needed. This goal led to the commissioning of a panel, in the summer of 1998, whose charge was to develop a comprehensive view and decadal program for astronomy and astrophysics in Canada. Fundamental to this process is the requirement that the vision articulated in the plan truly reflects the needs of the Canadian astronomical community as a whole and represents the consensus of our community.

The Long Range Planning Panel (LRPP) was established by the National Research Council (NRC) and the Natural Sciences and Engineering Research Council (NSERC) with the full participation of the Canadian Astronomical Society (CASCA). The chair was selected in mid July of 1998, and the membership of the panel developed with the full participation of all three agencies over the next month. The seven member panel consists of Ralph Pudritz (Chair, McMaster University), Andrea Dupree (Harvard-Smithsonian Centre for Astrophysics), William Harris (McMaster University), Gilles Joncas (Université Laval), Simon Morris (NRC's

Herzberg Institute for Astrophysics), Ernie Seaquist (University of Toronto), and Jack Welch (University of California at Berkeley). The formal mandate of the LRPP (posted on LRPP web site) was communicated to it in August, and made available to the community in early September, 1998.

The LRPP developed many mechanisms to ensure that the community was fully engaged in the planning exercise. The HIA established, for the LRPP, a web site <http://www.hia.nrc.ca/lrpp/> on which public discussion and comment on the plan could be made, and at which all of the preliminary papers, announcements, and early versions of the plan were posted. Five separate subcommittees of CASCA (radio, optical and infrared, space, theory, and education), plus one additional ad hoc committee on computation were consulted in order to provide the LRPP with advisory reports on issues within their respective areas. In addition, the LRPP solicited advisory papers from many other groups within our community. These provided more detailed examination of specific projects such as a Canadian Large Adaptive Reflector (CLAR), the Next Generation Space Telescope (NGST), a wide-field 8 metre optical/infrared telescope, etc. A subset of these advisory papers constitutes Volume II of our report, which is posted on the LRPP web-site. All of these subcommittees and other groups began their work in September 1998, and submitted their papers to the LRPP by mid-February, 1999. A third way of interfacing with our community was through a series of town hall meetings that were held across the country; at the Université de Montreal (Dec. 2, 1998), the University of Toronto (Dec. 5, 1998), the University of Calgary (Dec. 14, 1998) and the University of Victoria (Dec. 15, 1998). A total of more than 160 astronomers participated in these town hall meetings, each of which consisted of both open presentations and discussion sessions, as well as the opportunity for many private interviews and discussions with the panel for anyone who wished. The panel met in early September and November 1998, and mid-February 1999 at McMaster University, as well as in late December 1998 at the HIA in the wake of the completed town hall meetings.

Various members of our community as well as international experts in specific areas of astronomy were invited to make presentations to the panel during these meetings. A series of e-mails outlining the preliminary findings of the panel were sent out to the community following the LRPP's 3-day policy meeting in mid-February which allowed the community the opportunity to gain an impression of how the community plan was developing. A draft of the plan was circulated for comments to members of the HIA and CASCA Boards in late May, as well as to the entire community in early June. The final document was prepared after the annual CASCA Meeting in Halifax in late June, 1999, when the community participated in a final and extensive, open discussion of the draft. In summary, the LRPP went through tremendous lengths to ensure that this planning process involved and consulted with the community at many different levels.

The LRPP appreciates the time and effort that our community has contributed towards making this exercise a success. We were impressed by the enthusiastic and substantial community response and participation in our deliberations. Our panel has found that sufficient time must be set aside in order to let ideas develop and reach fruition during such an ambitious planning exercise; a full year should be set aside ideally bracketed by two summer CASCA Meetings. There is a great depth of design

and purpose in this plan that has repercussions far outside the immediate area of astronomy and astrophysics in Canada over the next decade. The LRPP believes that this kind of decadal planning exercise provides a valuable means of developing a long range vision of our needs throughout the decades to come.

There are many people to thank for their unstinting help and wise counsel over this last year. The panel is grateful for the efforts of the advisory committees and thanks their chairs in particular for the timely preparation of their reports. Likewise, we thank the authors of the many advisory papers for their thoughtful written reports and detailed studies. Many readers gave us interesting suggestions and comments on early drafts of the text and we thank all the writers of those many, many e-mails for their advice. We thank the members of the HIA Advisory and CASCA Boards, Jim Hesser, and Tom Landecker for their written comments on the draft as well. Don Morton (NRC, Director General HIA), Michael de Robertis (CASCA President), and Kate Wilson (NSERC) provided us with invaluable resources and comments at many points along the way. We thank Eugene Martinello (Creative Services Supervisor, McMaster) and his staff for their imaginative production of this volume. In addition, Patricia Monger (CIS, McMaster) provided us with excellent computer assistance throughout this exercise, and Robert Hay (McMaster) and Robert Lamontagne (Montréal) helped us to design a successful public outreach effort that unfolded during the course of the year.

Finally, I am grateful for the wisdom, energy, commitment, and scientific depth that all members of the LRPP constantly displayed throughout this arduous, but rewarding, undertaking.

Ralph E. Pudritz,

Chair

Long Range Planning Panel

McMaster University, August, 1999.