TRIUMF

ANNUAL REPORT
SCIENTIFIC ACTIVITIES
2003

ISSN 1492-417X

CANADA'S NATIONAL LABORATORY
FOR PARTICLE AND NUCLEAR PHYSICS

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NATIONAL RESEARCH COUNCIL OF CANADA

DECEMBER 2004

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Postal Address:

TRIUMF
Publications Office
4004 Wesbrook Mall
Vancouver, BC V6T 2A3
Canada

http://www.triumf.ca/annrep

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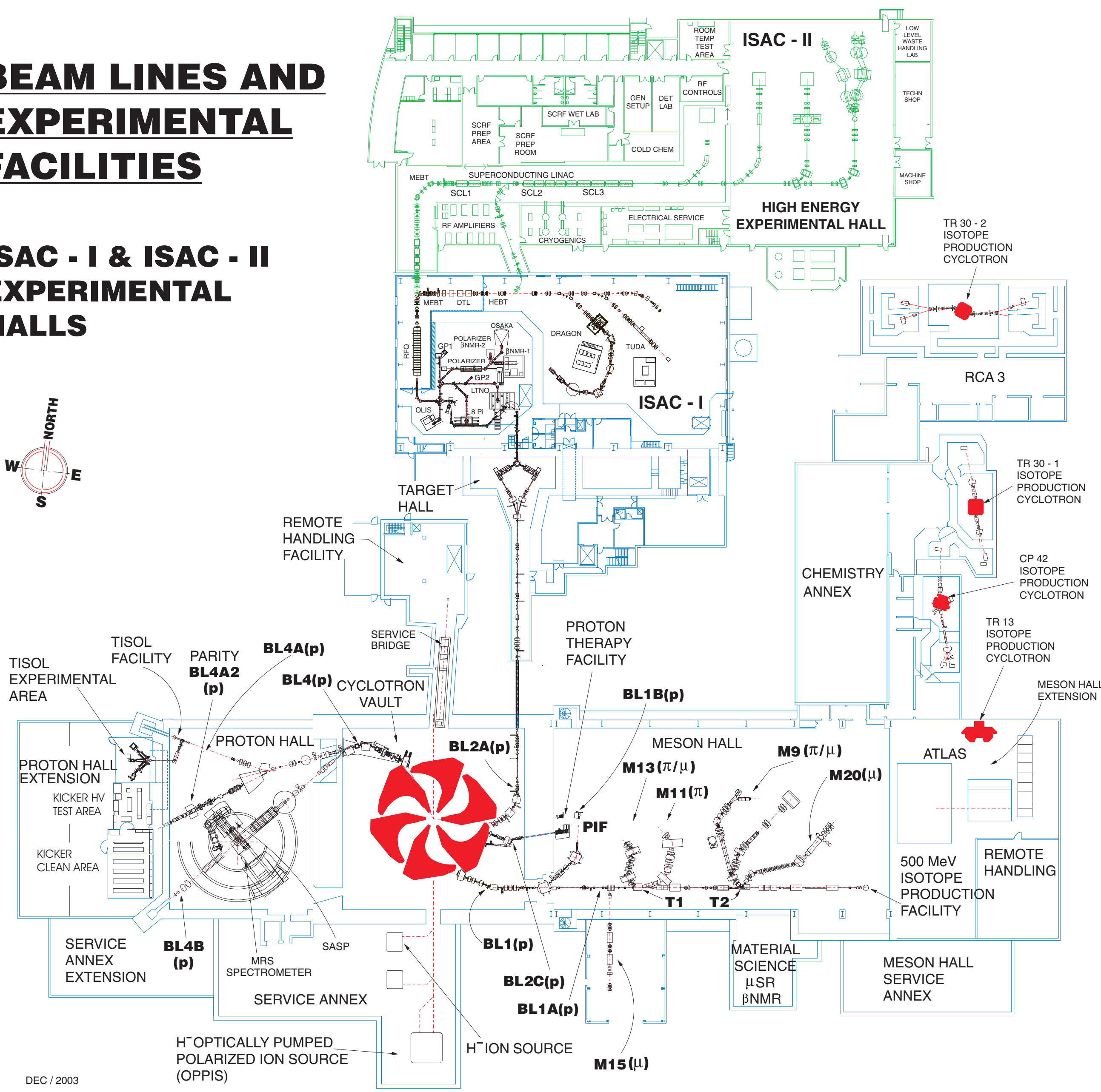
ISAC - I & ISAC - II EXPERIMENTAL HALLS



DEC / 2003

The contributions on individual experiments in this report are outlines intended to demonstrate the extent of scientific activity at TRIUMF during the past year. The outlines are not publications and often contain preliminary results not intended, or not yet ready, for publication. Material from these reports should not be reproduced or quoted without permission from the authors.

FOREWORD

The year 2003 was one of major accomplishments for TRIUMF. I take special pleasure on behalf of the Board of Management in congratulating Dr. Shotter and every one of the dedicated TRIUMF staff whose hard work and exceptional talent contributed to making it so. The opening of the ISAC-II building was a significant milestone as was the completion of 52 warm quadrupole magnets for CERN. I also wish to acknowledge the contributions of the researchers from Canadian Universities and TRIUMF whose talent and drive have resulted in an unprecedented level of peer reviewed funding for TRIUMF related research in 2003. Equally important to the high quality of the science program has been the contribution of many visitors from abroad.

Of particular note this year was the completion of an excellent Five Year Plan for the period 2005–2010. The effort of TRIUMF Management, members of the planning committee along with TRIUMF users groups and staff all helped to ensure the plan would be both exciting and realistic. The reaction of the National Research Council's peer review committee and of ACOT reflected their very positive reaction to the plan.

2003 was also a year of growth. The Board was pleased to welcome the University of Guelph as an associate member, in keeping with its increasing involvement with TRIUMF. This represents an important step in the realization of TRIUMF's role as Canada's National Laboratory for Particle and Nuclear Physics.

W.J. McDonald
Chair, Board of Management

TRIUMF was established in 1968 as a laboratory operated by the University of Alberta, the University of British Columbia, Simon Fraser University and the University of Victoria under a contribution agreement from the National Research Council of Canada. The initial consortium has been expanded to include Carleton University as a full member, and the University of Guelph, the University of Manitoba, McMaster University, the Université de Montréal, Queen's University, the University of Regina, and the University of Toronto as associate members. The facility is operated for all Canadian as well as foreign users.

The experimental program is based on a cyclotron which is capable of producing four simultaneous beams of protons, two of which are individually variable in energy from 180–520 MeV, the third from 472–510 MeV, and the fourth between 70 and 110 MeV. The potential for high beam currents – 100 μA at 500 MeV to 300 μA at 400 MeV – qualified this machine as a "meson factory". The third high intensity beam line feeds the new isotope production facility, ISAC, which started operation in 1998 and qualifies as a second generation radioactive beam facility.

Fields of research include basic science, such as particle physics, nuclear physics, nuclear astrophysics, and condensed matter research, as well as life sciences based primarily on isotope research. There is also a biomedical research facility which uses protons for treatment of ocular melanomae. TRIUMF is providing the Canadian contribution to the Large Hadron Collider at CERN and TRIUMF resources are also available to support the Canadian subatomic program at other laboratories.

The ground for the main facility, located on the UBC campus, was broken in 1970. Assembly of the cyclotron started in 1971. The machine produced its first full-energy beam in 1974 and its full current in 1977.

The laboratory employs approximately 325 staff at the main site in Vancouver and 19 based at the participating universities. The number of university scientists, graduate students and support staff associated with the present scientific program is about 625.