TRIUMF

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SCIENTIFIC ACTIVITIES
2000

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CANADA'S NATIONAL LABORATORY
FOR PARTICLE AND NUCLEAR PHYSICS

OPERATED AS A JOINT VENTURE

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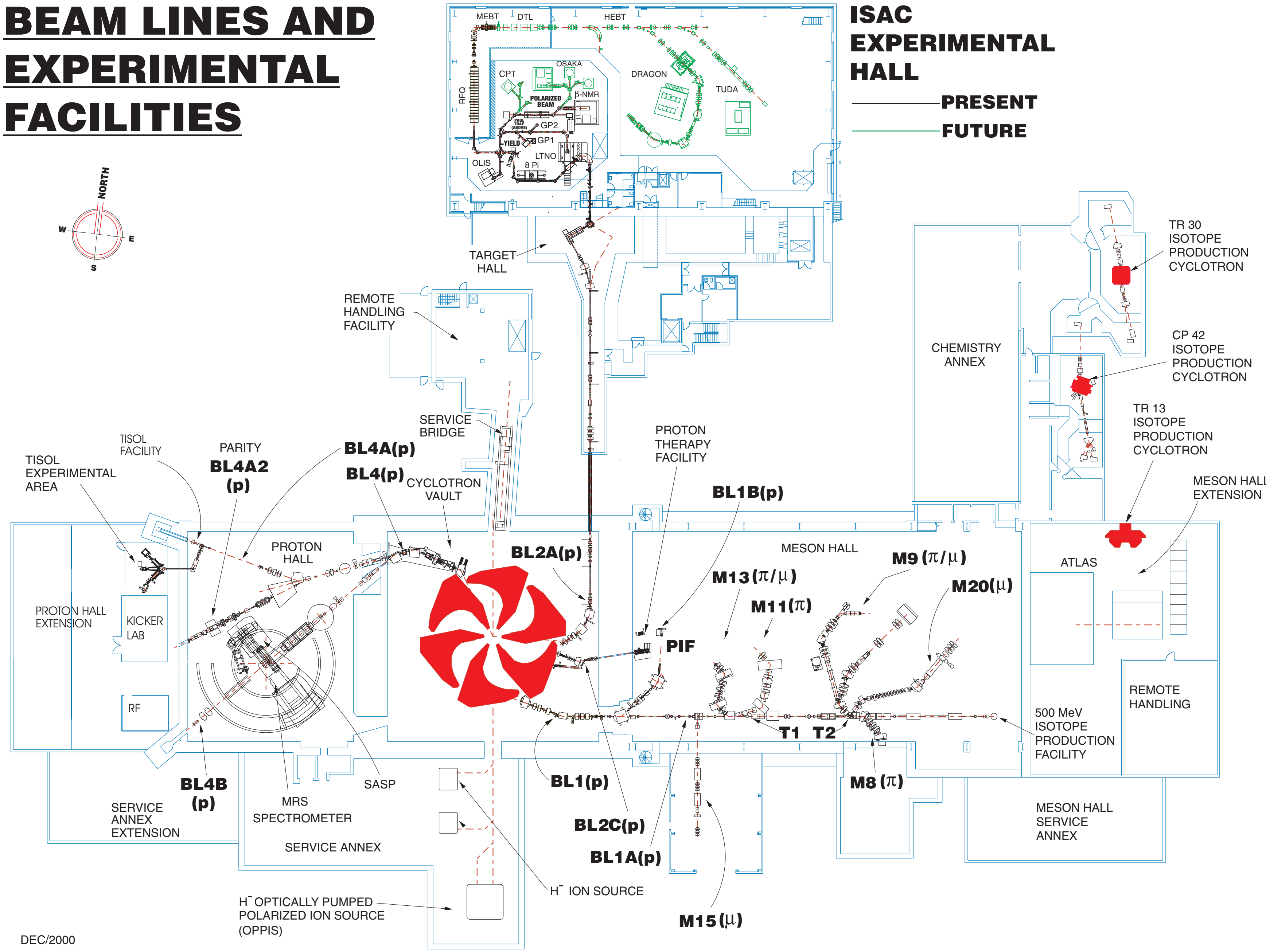

DEC/2000

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

I am delighted to report that the year 2000 was one of exceptional achievement for TRIUMF.

This was clearly reflected in the announcement by the federal government that our funding for 2000–2005 would be $200 million, a remarkable 20% increase over our previous level of funding. This represented a strong vote of confidence in TRIUMF by the federal government and recognised the successful construction and commissioning of ISAC-I, our success in the continuing provision of Canada's contribution to the LHC at CERN and our strong commitment to providing infrastructure support to subatomic physics across Canada.

I had the privilege of visiting CERN in the summer of 2000 and seeing first-hand the nature of our LHC contribution and can report on the very high regard in which TRIUMF is held by CERN.

With the announcement of our renewed funding, the Joint Venture Agreement was revised and updated to allow the admission of Carleton University as a full member of TRIUMF. Carleton became the first full member to join TRIUMF in over 25 years and TRIUMF will be strengthened considerably by their presence. It was also necessary for the full member universities to sign a new Contribution Agreement with the National Research Council formalising the laboratory's responsibilities under the new funding envelope. The Board is grateful to the universities for their support and cooperation in acting expeditiously, both on the Joint Venture and the Contribution Agreement.

During 2000, the search for a new Director to replace Alan Astbury in September of 2001 was concluded and the Board was very pleased to appoint Dr. Alan Shotter of the University of Edinburgh as the incoming Director. The Board certainly looks forward to working closely with Alan Shotter in the coming years.

In closing, I would like to recognise on behalf of the Board the commitment and the quality of the contribution of all of the TRIUMF staff, of the Division Heads and of the Director, Alan Astbury, and the outstanding record of achievement of the last six years. In particular, Alan Astbury has brought to TRIUMF a leadership and a vision that has raised the laboratory to true national stature and when he steps down in September 2001 he will leave the enviable legacy of a laboratory which is achieving at the highest levels and which has remarkable promise for the future. We, and indeed Canadian science, owe him a debt of gratitude.

C.H.W. Jones.

C.H.W. Jones
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 Manitoba, 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.