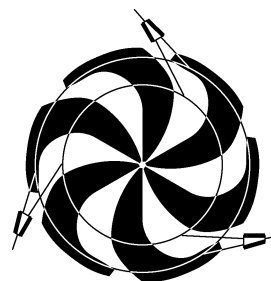


TRIUMF



ANNUAL REPORT SCIENTIFIC ACTIVITIES 1999

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**CANADA'S NATIONAL LABORATORY
FOR PARTICLE AND NUCLEAR PHYSICS**

OPERATED AS A JOINT VENTURE

MEMBERS:

THE UNIVERSITY OF ALBERTA
SIMON FRASER UNIVERSITY
THE UNIVERSITY OF VICTORIA
THE UNIVERSITY OF BRITISH COLUMBIA

ASSOCIATE MEMBERS:

CARLETON UNIVERSITY
THE UNIVERSITY OF MANITOBA
L'UNIVERSITÉ DE MONTRÉAL
QUEEN'S UNIVERSITY
THE UNIVERSITY OF REGINA
THE UNIVERSITY OF TORONTO

UNDER A CONTRIBUTION FROM THE
NATIONAL RESEARCH COUNCIL OF CANADA

JULY 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.

ORGANIZATION

Board of Management

The Board of Management of TRIUMF manages the business of the facility and has equal representation from each of the four founding universities. At the end of 1999 the Board comprised:

University of Alberta	Dr. P. Kitching Dr. W.J. McDonald Dr. A. Noujaim	
Simon Fraser University	Dr. W.S. Davidson Dean C.H.W. Jones Dr. R.G. Korteling	Chairman
University of Victoria	Ms. G. Gabel Dr. V. Paetkau Dr. M. Taylor	
University of British Columbia	Dr. D. Dolphin Dr. L. Skarsgard Dr. B. Turrell	

Towards the end of 1987, Board membership was expanded in anticipation of a broadening of the TRIUMF joint venture to include a more national representation of Canadian universities long associated with the TRIUMF experimental program. The University of Manitoba and Université de Montréal became associate members, and the University of Toronto joined as an observer. At the end of 1988, University of Toronto status changed from that of observer to associate member. In March, 1989 the University of Regina became an associate member. In December, 1998 Carleton University and Queen's University became associate members. Associate membership at year-end:

Associate members:	Dr. P.J.S. Watson Dr. J. Keselman M. G. Michaud Dr. A.B. McDonald Dr. K. Denford Dr. P. Sinervo	Carleton University University of Manitoba Université de Montréal Queen's University University of Regina University of Toronto
Non-voting members:	Ms. J. Verrett Dr. P. Sinervo Dr. A. Astbury Dr. J.-M. Poutissou Mr. J. Hanlon	National Research Council ACOT/University of Toronto Director, TRIUMF Associate Director, TRIUMF TRIUMF Recording Secretary

The following changes occurred in Board membership in 1999: Dr. W.S. Davidson replaced Dr. B.P. Clayman as Simon Fraser University member; Dr. V. Paetkau replaced Dr. T. Gough as University of Victoria member; Drs. D. Dolphin, L. Skarsgard and B. Turrell replaced Drs. B. Bressler, C. Eaves and D.F. Measday as University of British Columbia members; M. G. Michaud replaced M. A. Caillé as Université de Montréal member; Dr. P. Sinervo replaced Dr. D.G. Stairs as a non-voting member. The board met 5 times during the year.

Administration

Under the directorship of Dr. A. Astbury, TRIUMF personnel were grouped into divisions, with division heads as follows:

Division Head, Science Division	J.-M. Poutissou
Division Head, Accelerator Technology Division	E.W. Blackmore
Division Head, Cyclotron Operations Division	G. Dutto
Division Head, Technology Transfer Division	P.L. Gardner
Division Head, Administration Division	I.M. Thorson
ISAC Project Leader	P.W. Schmor

Operating Committee

The Operating Committee of TRIUMF is responsible for the operation of the facility. It reports to the Board of Management through its chairman, the Director, Dr. A. Astbury. The Operating Committee consists of one voting member from each of the four universities, two voting members representing the interests of external users and one representing TRIUMF staff. The Associate Director is a non-voting member. Members of the committee (alternate members in parentheses) at the end of 1999 were:

Dr. A. Astbury	Chairman	Director	
Dr. J.-M. Poutissou	<i>(ex officio)</i>	Associate Director	
Dr. N. Rodning		University of Alberta	(Dr. L.G. Greeniaus)
Dr. P. Percival		Simon Fraser University	(Dr. K.P. Jackson)
Dr. R. Keeler		University of Victoria	(Dr. M. Roney)
Dr. C. Hearty		University of British Columbia	(Dr. M.D. Hasinoff)
Dr. E. Mathie		Users	(Dr. J. Waddington)
Dr. J. Vincent		Users	(Dr. G. Marshall)
Dr. T.J. Ruth		TRIUMF	(Mr. K. Reiniger)
Mr. J. Hanlon	Recording Secretary	TRIUMF	
Ms. J. Verrett	<i>(ex officio)</i>	National Research Council	

Changes in 1999: Dr. R. Keeler replaced Dr. M. Lefebvre as University of Victoria member; Dr. C. Hearty replaced Dr. M.D. Hasinoff as University of British Columbia member with Dr. Hasinoff as alternate; Dr. E. Mathie replaced Dr. W.T.H. van Oers as one of the Users members with Dr. J. Waddington as alternate; Dr. J. Vincent replaced Dr. J. Rogers as the other Users member with Dr. G. Marshall as alternate; Dr. T.J. Ruth replaced Mr. J. Yandon as TRIUMF member with Mr. K. Reiniger as alternate. The Operating Committee met 11 times in 1999.

NRC Advisory Committee on TRIUMF

Dr. P. Sinervo	Chairman	University of Toronto
Dr. D. Santry	Secretary	National Research Council
Dr. A.J. Berlinsky		McMaster University
Dr. R. Boyd		Ohio State University
Dr. A. Fenster		J.P. Robarts Research Inst.
Dr. J. Guigné		Guigné International Ltd.
Dr. P.-G. Hansen		Michigan State University
Dr. G. Kalmus		Rutherford Appleton Lab
Prof. V. Soergel		Werner-Heisenberg-Institut
Dr. R. Taylor		SLAC
Dr. P. Vincett		FairCopy Services Inc.
Dr. R. Carnegie	<i>(ex officio)</i>	Carleton University
Dr. C.H.W. Jones	<i>(ex officio)</i>	Simon Fraser University
Dr. P. Kalyniak	<i>(ex officio)</i>	Carleton University

Changes in 1999: Dr. P. Sinervo replaced Dr. D.G. Stairs as chairman; Drs. A.J. Berlinsky, P. Vincett, R. Boyd, A. Fenster, J. Guigné and G. Kalmus replaced Drs. J.C. Hardy, J.G. Martel, D. Perkins and B. Peters.

Agency Committee on TRIUMF

Dr. A.J. Carty	Chairman	President, National Research Council
Dr. T. Brzustowski		President, Natural Sciences and Engineering Research Council
Mr. K. Lynch		Deputy Minister, Industry Canada
Ms. O. Lennie		Deputy Minister, Western Canada Economic Diversification
Ms. J. Verrett	Secretary	National Research Council

Changes in 1999: Ms. O. Lennie replaced Mr. J. McLure as Deputy Minister, Western Canada Economic Diversification.

TRIUMF Safety Management Committee

Dr. A. Astbury		Director, TRIUMF
Dr. J.-M. Poutissou		Associate Director/Head, Science Division
Dr. E.W. Blackmore		Head, Accelerator Technology Division
Dr. G. Dutto		Head, Cyclotron Operations Division
Mr. P.L. Gardner		Head, Technology Transfer Division
Mr. I.M. Thorson		Head, Administration Division
Dr. P.W. Schmor		ISAC Project Leader
Mr. J. Drozdoff		Head, TRIUMF Safety Group
Mr. M. Stenning		Head, Operations Group
Dr. M. Adam		TAPC Chairman
Mr. G. Wood		Industrial Safety Officer/TAPC
Mr. L. Moritz		Senior Safety Officer
Mr. J. Hanlon		Manager, Human Resources & Administrative Services
Dr. N. Stevenson		Head, Applied Technology Group
Mrs. K. Gildert	Recording Secretary	

Experiments Evaluation Committee

Subatomic Committee:

Dr. K. Langanke	Chairman	Aarhus University
Dr. J.-M. Poutissou	Associate Director/ <i>(ex officio)</i>	TRIUMF
Dr. H. Fearing	Secretary	TRIUMF
Dr. J.M. D'Auria		TUEC/SFU
Dr. L. Buchmann		TUEC Past Chairman/TRIUMF
Dr. W.C. Haxton		University of Washington
Dr. H.O. Meyer		Indiana University
Dr. A. Richter		Technische Universität Darmstadt
Dr. I.S. Towner		Queen's University
Dr. M.C.T. Wiescher		University of Notre Dame

μ SR Committee:

Dr. M. Thewalt	Chairman	Simon Fraser University
Dr. J.-M. Poutissou	Associate Director/ <i>(ex officio)</i>	TRIUMF
Dr. P.W. Percival	Secretary/ <i>(ex officio)</i>	TRIUMF
Dr. I.K. Affleck		University of British Columbia
Dr. D.K. Bohme		York University
Dr. B. Gaulin		McMaster University
Dr. S. Roorda		Université de Montréal
Dr. R.E. Wasylshen		Dalhousie University

In July, 1994 the Experiments Evaluation Committee was formally split into two committees representing subatomic physics and μ SR physics. Changes in membership during the year were: Dr. J.M. D'Auria joined as TUEC chairman, and Dr. L. Buchmann replaced Dr. M.D. Hasinoff as TUEC past chairman; Drs. C. Batty, P.-G. Hansen and B.R. Holstein completed their terms (Subatomic). The committee welcomed Dr. H.O. Meyer (Subatomic) and Dr. B. Gaulin (μ SR).

Life Sciences Project Evaluation Committee

Dr. T. Lewellen	Chairman	University of Washington
Dr. J.-M. Poutissou	Associate Director	TRIUMF
Dr. L.P. Robertson	Secretary	University of Victoria
Dr. D.A. Axen		University of British Columbia
Dr. R. Finn		Memorial Sloan-Kettering Cancer Center
Dr. J. Fowler		Brookhaven National Laboratory
Dr. D.C. Price		University of California, San Francisco
Dr. R.L. Wahl		University of Michigan

Changes in 1999: Drs. T. Budinger and R. Flocchini completed their terms. The Committee welcomed Drs. D.C. Price and R.L. Wahl.

Biomedical Experiments Evaluation Committee

Dr. L.D. Skarsgard	Chairman	British Columbia Cancer Research Centre
Dr. J.M. Cameron		EEC/IUCF
Dr. D.A. Axen		EEC/University of British Columbia
Dr. M.J. Ashwood-Smith		University of Victoria
Dr. A. Astbury		TRIUMF
Dr. R.R. Johnson		University of British Columbia
Dr. T.R. Overton		University of Alberta
Dr. D.C. Walker		University of British Columbia
Dr. G.F. Whitmore		University of Toronto