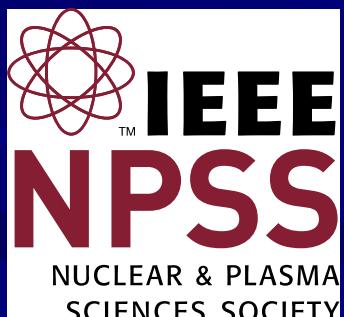


A short history of Real Time Conferences



P. Le Dû

patrickledu@me.com



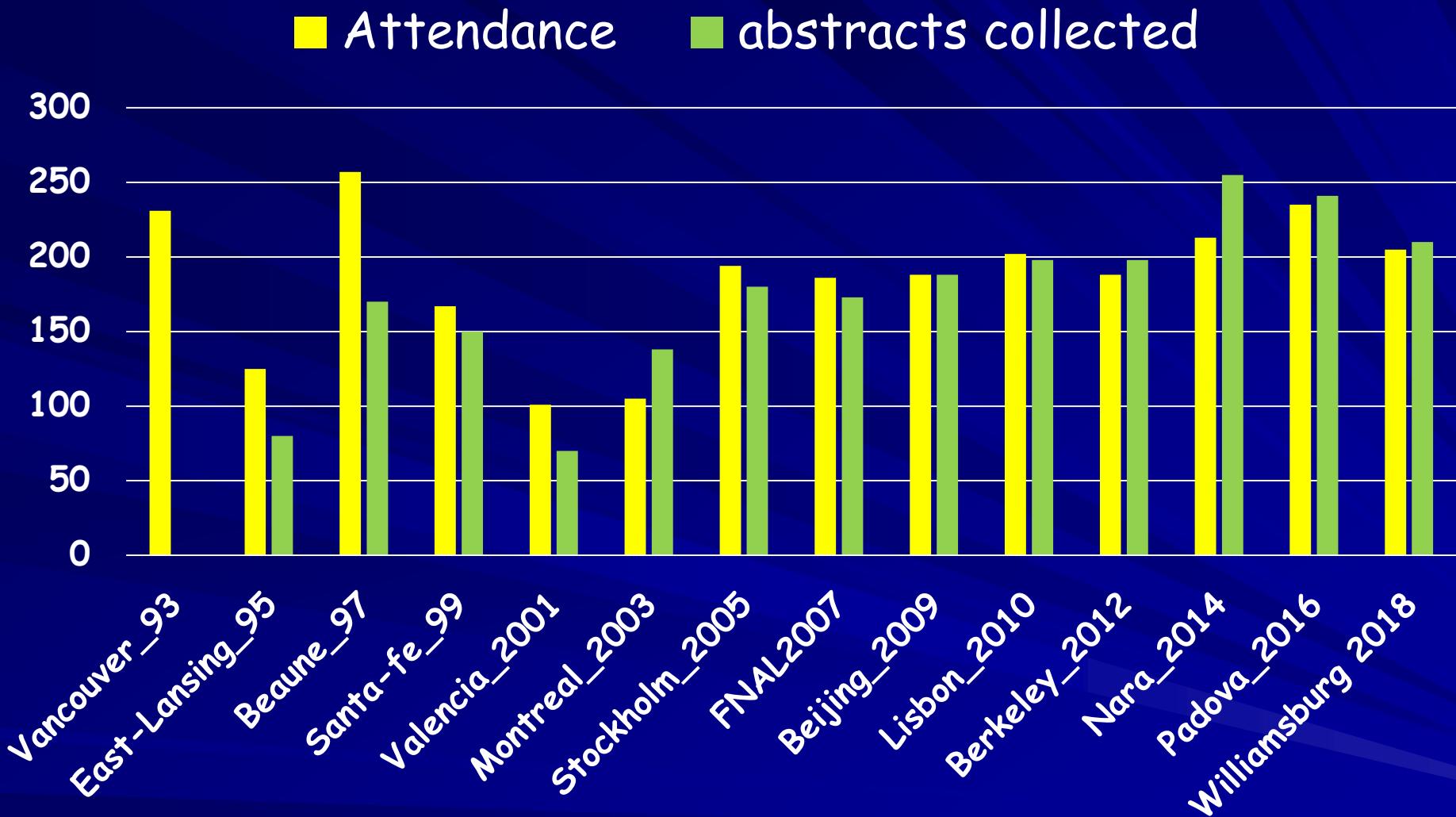
Goals of this presentation



- Give you a little overview of the Real Time Conference over the last 50 years
- I was around for the last 27 years (1993-2000)
- Its evolution to become what it is today
- Apologize if my memory forget something
- I was using some personal documents and photos
- Thanks to Dick Kouzes who gave a lot of information



Long term statistics (1993-2018)



The prehistoric times 1969-1983

- 1969: Skytop Conference
- 1979: RT-1 Santa Fe (Dennis Perry, conference chair)
- 1979: ad hoc Real-Time Committee formed
- 1981: RT-2 Oak Ridge (Dave Hensley, conference chair)
Objective : begin activities such as creating a tape format for data storage (released as the CANPS format in 1987), and trying to obtain funding to set up a central repository for nuclear and particle physics software in the US.
- 1983: RT-3 Berkeley (Creve Maples, conference chair)

1984: IEEE CANPS Committee formed
Ed Barsotti (FNAL) 1st CANPS chair

Parallel projection

The early period 1984-92

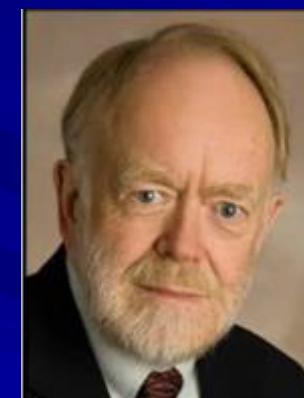
			Chair	CANPS Chair	Award
1985	RT-4	Chicago (US)	Lester Welch	Ed. Barsotti	
1987	RT-5	San Francisco (US)	Denis O'Brien	Lester Welch	Edwin Norbeck
1989	RT-6	Williamsburg (US)	Roy Whitney	Dick Kouzes	René Brun
1991	RT-7	Julish (GE)	Klaus Mueller	Dick Kouzes	Harry Bisby



Dick Kouzes
PNL



Ed Barsotti
FNAL



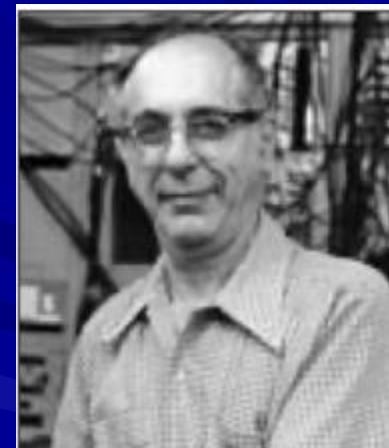
Peter Clout
Vista Control System

1st European RT in
Julich

The new age (1993-2001)

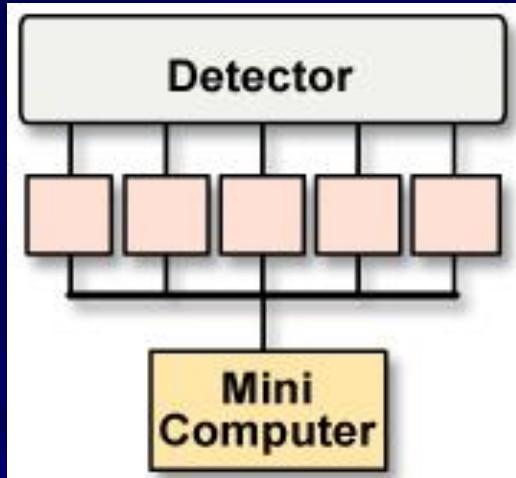
			Chair	CANPS Chair	Award
1993	RT-8	Vancouver (Can)	Renée Poutissou	Ruth Pordes	Lou Costrel
1995	RT-9	East Lansing (US)	Ron Fox	Renée Poutissou	----
1997	RT-10	Beaune (F)	Patrick Le Dû	Tom Kozlowski	Phil Ponting
1999	RT-11	Santa Fe (US)	Tom Kozlowski	Christian Boulin	Robert Downing
2001	RT-13	Valencia (SP)	Antonio Ferrer	Christian Boulin	-----

- Majority of HEP : LEP, FNAL Tevatron, SSC, DESY HERA, SLAC (PEP)
- LHC, , SSC SLAC Babar,, Tevatron R2, Tristan, BNL RHIC Fusion,
- Read Out electronics : DSP ... CAMAC, , Fastbus modules
- Filter and processor farm concept
- (Emulator 370E, Transputers, RISC, ACP , PCI Express, Rapid IO
- software (OS9 ...)
- Microprocessor and VME standard
- Test beam systems
- Event builder (and fast links GB ethernet, ATM ...



*Louis Costrell
1915-2009*

Evolution of DAQ technologies and architectures

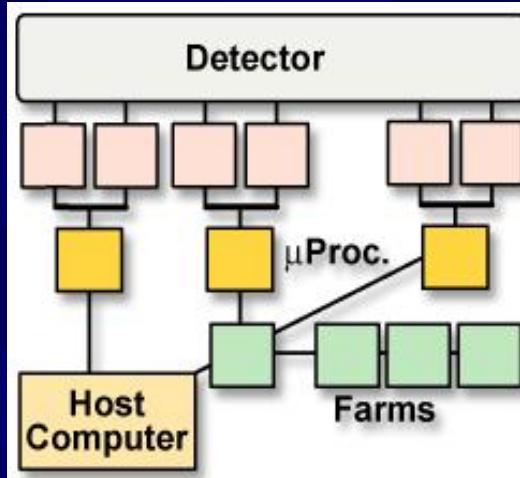


1970-80

CERN PS/SPS

Minicomputers

Readout custom design
First standard: CAMAC
kByte/s

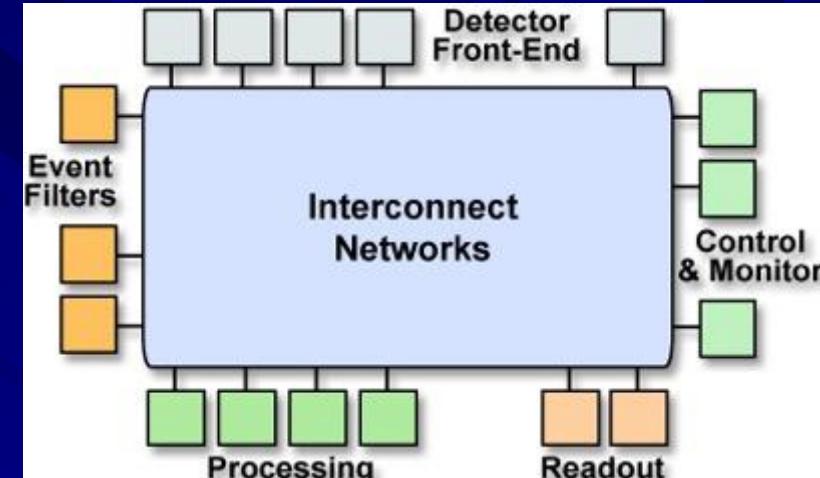
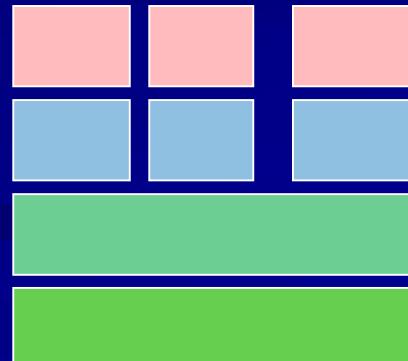


1980-90

LEP

Microprocessors

HEP standards (Fastbus)
Embedded CPU,
Industry standards (VME)
MByte/s

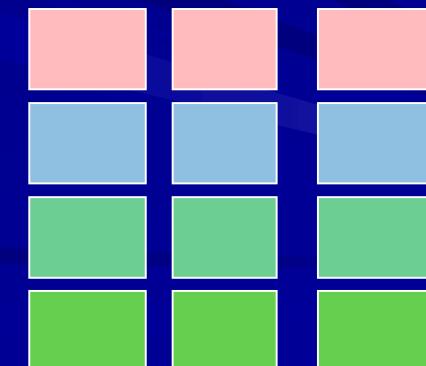


2007 ...

LHC (CMS)

Networks/Grids

IT commodities, PC, Clusters
Internet, Web, etc.
GByte/s



Beaune 97

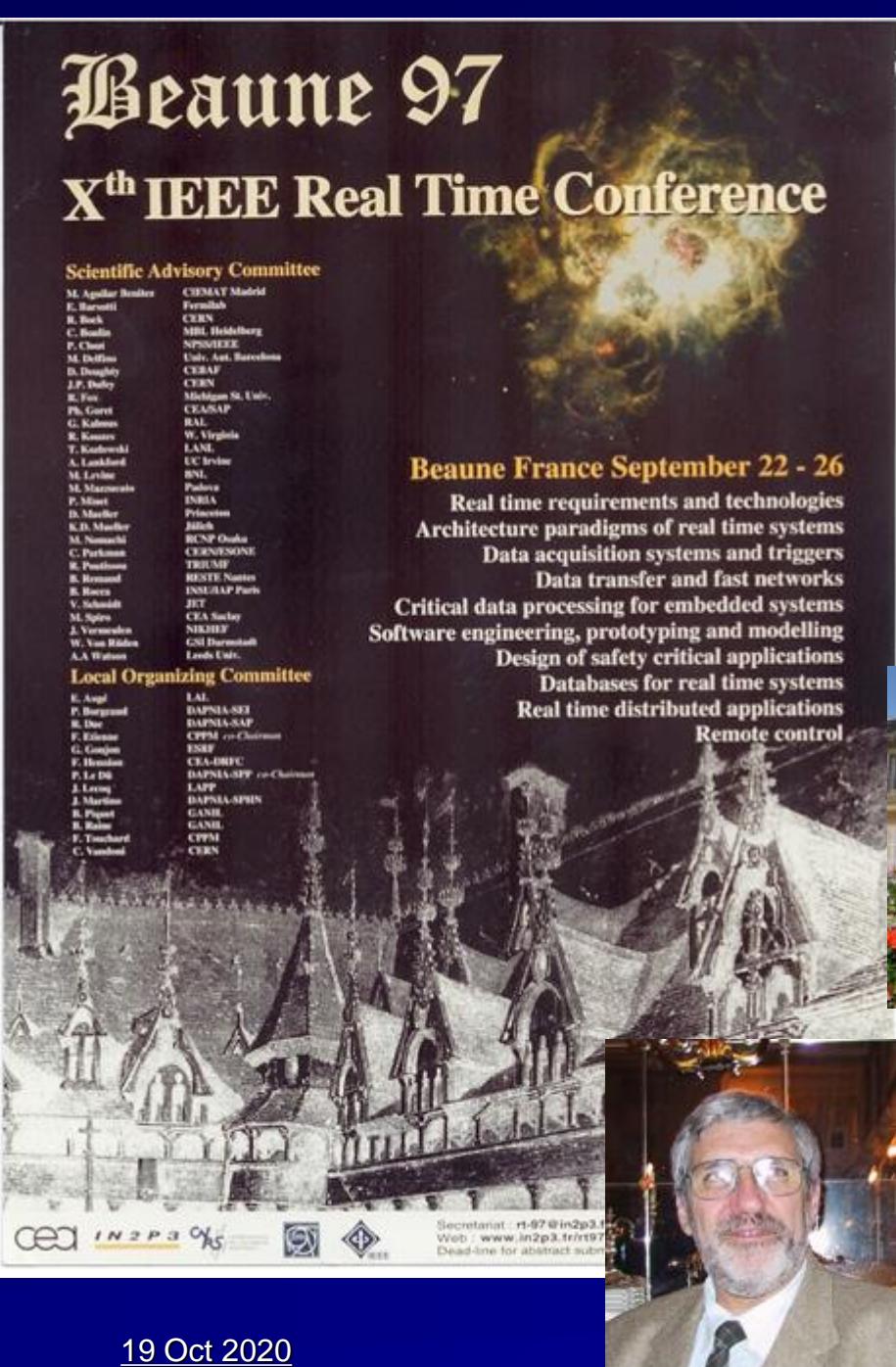
Xth IEEE Real Time Conference

Scientific Advisory Committee

M. Aguilar-Benitez CERNAT Madrid
E. Baroni Fermilab
R. Bois CERN
J. Casals MBL Heidelberg
F. Chastin NPS/IEEE
M. Drissi Univ. Aut. Barcelona
B. Douglass CERAF
J.P. Duley CERN
R. Fein Michigan St. Univ.
Ph. Gaultier CEASAP
G. Kalman RAL
E. Kausse W. Virginia
T. Kowalewski LANL
A. Luskford UC Irvine
M. Levine BNL
M. Mazzonati Padova
P. Mistet INRIA
D. Mueller Princeton
A.J. Mueller JHU
M. Neumann BNL
C. Perini CERN/DSU
K. Peticolas TRIUMF
B. Renouard RESTE Nantes
B. Racine INRS/CEA Paris
V. Schmidt JET
M. Spiros CEA Saclay
J. Vermaelen NIKHEF
W. Van Riemsdijk GSII Darmstadt
A.A. Watson Leeds Univ.

Local Organizing Committee

E. Angel LAL
P. Bergstrand DAPNIA-SEI
R. Due DAPNIA-SAP
F. Etienne CPPM co-Chairman
G. Guiglion ESR
F. Hennequin CLA-DIFC
F. Idel DAPNIA-SPP co-Chairman
J. Lecomte LAPP
J. Martin DAPNIA-SPIN
B. Piquet GANIL
B. Raison GANIL
F. Trouillard CPPM
C. Vandino CERN



1997 Beaune France



The Hotel Dieu



Chateau de Meursault dinner Wine tasting



The new age (2003-2010)

			Chair	CANPS Chair	Award
2003	RT-13	Montreal (Can)	J.P. Martin	Christian Boulin	-----
2005	RT-14	Stockholm (SE)	Richard Jacobson	J.P. Martin	Ed Barsotti
2007	RT-15	FNAL (US)	Margaret Votava	J.P. Martin	Peter Clout
2009	RT-16	Beijing IHEP (CN)	Yifang Wang	J.P. Martin	S. Cittolin
2010	RT-17	Lisbon (P)	Carlos Varandas	Stefan Ritt	A. Luchetta

- HEP (LHC) Fusion Medical Imaging,
- MTCA standard
- FPGA

13th REAL TIME Conference 2003



Latest developments on Real Time techniques in Plasma, Nuclear, Particle Physics, in Astrophysics and applications in Biology, Medicine and Industry

Program Committee

Chair : P. Le Diz (CEA, FR)

F. Barone (INFN, IT)
C. Bouali (ENRE, DE)
D. Calvet (CEA, FR)
P. Delil (Vista System, U.S.A.)
J.P. Doty (CERN)
Ph. Gavillet (CERN)
R. Krasnitz (PR, U.S.A.)
T. Kossovski (LANL, U.S.A.)
A. Lankford (UC, U.S.A.)
J. Lees (CNRS/INPS, FR)
W. Hines (LLNL, U.S.A.)
M. Normachi (Duke, JP)
K. Schmidt (EURATOM)
H. Von Der Schmitz (DESY, DE)
G. Wilts (Washington U, U.S.A.)

Local Organizing Committee

Chair : J.P. Martin
(Uvu de Montréal)

R.A. Amieudz (TRIUMF)
R. Lecomte (Uvu de Montréal)
C. Leroy (Uvu de Montréal)
D. Karlekar (Univ. of Victoria)
R. Pouliot (TRIUMF)
K. Rogers (Univ. McGill, Montréal)

Local arrangements :
H. Martin (Montréal)

Sessions

- Real Time systems architecture
- Signal processing
- Algorithms implementation
- Trigger and data acquisition
- Event building and fast networks
- Controls, monitoring and GUI's
- Software framework and tools
- On line databases
- Networked computing (i.e. GRID's.)
- Industrial standards and trends
- Medical imaging processing

Short Courses and Tutorials

E-mail: rt2003@hep.saclay.cea.fr

<http://www-dapnia.cea.fr/rt2003> AMU presentation

2003 Montreal



Jean -Pierre Martin
Chair

Fields	%
HEP	55
Plasma	11
Nuclear Physics	9
Medical (new)	8
Astrophysics	7
Others	10

2003 Montreal Omni Hotel



J.P. Dufey CERN



M. Levine`BNL



*Dinner at the
Omni Hotel*



14th IEEE-NPSS Real Time Conference 2005

AlbaNova University Centre
Stockholm, Sweden



June 5-10, 2005

Interdisciplinary conference on the latest real time computing applications in plasma physics, nuclear physics, particle physics, astrophysics, and in accelerators and medicine.



www.sysf.physto.se/RT2005

Conference topics

- Real Time system architectures
- Front-end signal processing
- High speed synchronous control systems
- Triggers and data acquisition
- Event building and fast networks
- Online processing farms and high level triggers
- Online databases
- Controls and monitoring systems
- Medical systems and data processing
- Emerging Real Time technologies
- Tutorial and Short courses

General Chair

Richard Jacobsson
CERN, BE2M@cern.ch
1211 Geneva 23 - Switzerland

Executive committee

Clemens Auer	Vienna University	11
Christian Bohm	ESRF	12
Patrick Le Diec	CERN	13
Jean-Pierre Drury	CERN	14
Roy Lerner	SLAC	15
Jean-Pierre Marton	University of Montreal	16

Local organizing committee

Christian Bohm	Sedleman University
Sten Holmström	Växjö University
Stig Larsson	Karlsruhe Institute
Bengt Lindqvist	Royal Institute of Technology
Mark Pruce	Royal Institute of Technology
Gunnar Sandqvist	Stockholm University

Organizing institutes and sponsors

Svea Malmö University, Sweden
Royal Institute of Technology, Stockholm, Sweden
CEA DAM/PSL, Saclay, France
CERN, Geneva, Switzerland
IEEE RTSS-CAMP
Royal Swedish Academy of Sciences, Stockholm, Sweden

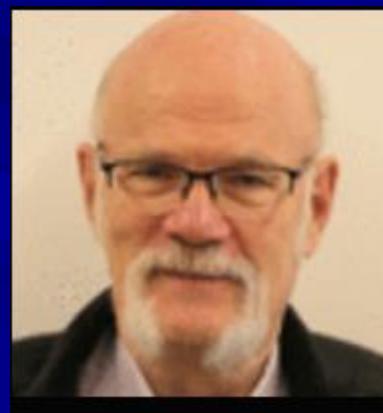
Abstract deadline
27 February 2005



2005 Stockholm



*Richard Jacobsson
Chair*



*Christian Bohm
Co-Chair*

**'Bo YU' Abstract
management system**

2007 Fermilab



IEEE NPSS 15th Real Time Conference

Fermilab, Batavia, Illinois, USA
April 29 - May 4, 2007

An interdisciplinary conference on the latest real time computing applications: nuclear & plasma sciences • particle physics • astrophysics • space science • accelerators • medicine & biology

Scientific Advisory Committee
Anghinolfi, Pierre-André (France)
Battesti, Fabrice (U of Paris)
Barker, Michael (University of Southern California)
Calvet, Denis (CEA Saclay)
Cerny, John (RRC)
Clout, Peter (BNL Brookhaven)
Dufay, Jean-Pierre (DSM)
Eckert, Michael (CERN)
Gammie, Howard (PSL)
Hanson, Mike R. (NRL)
Hayes, Graham (JRL)
Henshaw, Klaus (BNL Brookhaven)
Hensley, Mike (BNL Brookhaven)
Holland, Michael (U of Wisconsin)
Sarkar, Richard (U of Wisconsin)
Krauss, Richard (PSL)

Le Du, Patrick (CNRS)
Lepage, Arlette (PSL)
Li, Yiqun (MITRE)
Lyon, Michael (PSL)
Lyon, Michael (University of Texas)
Luo, Jianping (Chinese Academy of Sciences)
Martini, Jean-Pierre (U of Bourgogne)
Nashchekin, Anatoly (PSL)
Nicolaidis, Manolis (PSL)
O'Dell, Virginia (PSL)
Purushotham, Martin (PSL)
Rhee, Steven (PSL)
Schmidt, Müller (CERN)
Sengupta, Dipak (PSL)
Votava, Margaret (PSL)
Wagstaff, Christopher B. (U of Wisconsin)
Yeh, G.-Z. (PSL)

<http://computing.fnal.gov/cd/rt07/>



Margaret
Votava
Chair

19 Oct 2020

CANPS Committee created
AMU presentation



Peter Clout Award

2009 IHEP Beijing

16th Real Time Conference

IEEE-NPSS Technical Committee on Computer Applications
In Nuclear and Plasma Sciences

May 10-16, 2009 IHEP, Beijing

An interdisciplinary conference on the latest real time computing applications in plasma physics, nuclear physics, particle physics, astrophysics, space science, accelerators, and in medicine and biology

Topics

- Ultra Fast Analog and Timing digitizer and converter
- Front-end Signal Processing
- Real Time System Architectures
- Trigger and Data Acquisition
- High Level Triggers
- Event Building and Fast Networks
- High Speed Synchronous Control
- Online Processing Farms
- Online Databases
- Controls and Monitoring Systems
- Emerging Real Time Technologies
- New standards (ATCA)

General Chair: WANG, Yifang, IHEP

General Co-Chair: SHU, Yantai, TJU

Email: rt09-chair@ihep.ac.cn

Phone: +86-10-8823-5014

Fax: +86-10-8823-3374

Chair, Local Organizing Committee

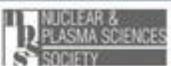
LIU, ZhenAn, IHEP

Email: rt09-chair@ihep.ac.cn

Phone: +86-10-8823-6718

Fax: +86-10-8823-3083

<http://www.ihep.ac.cn/english/conference/rt2009/>



Yifang Wang
Chair

Zen Ann Liu
Program Chair





Posters



Conference room



S. Cittolin



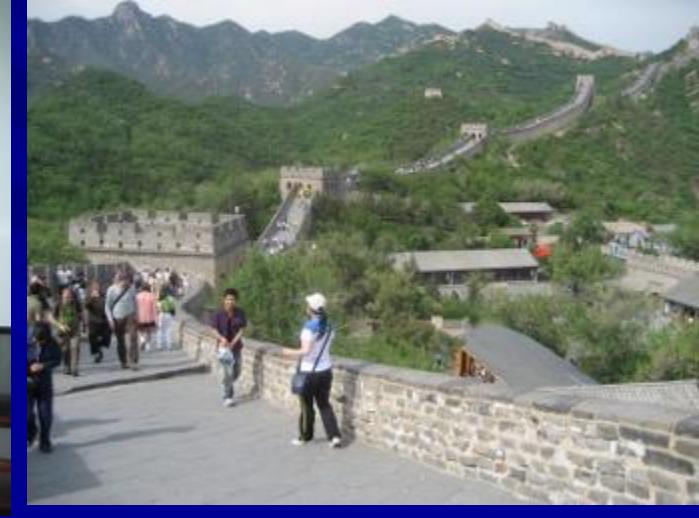
Short course

19 Oct 2020



Students award

AMU presentation



Great Wall
Excursion¹⁵

2009 Beijing Dinners



AMU pr

2009 Beijing



Membership

We have to thanks them!

17th Real Time Conference



IEEE-NPSS Technical Committee
on

Computer Applications in Nuclear and Plasma Sciences

24-28 May 2010, Lisboa, Portugal



ORGANIZED BY



ipfn
INSTITUTO DE PLASMAS E FUSAO NUCLEAR



TOPICS

- Ultra Fast Analog and Timing digitizer and converter
- Front-end Signal Processing
- Reconfigurable Hardware
- Real Time System Architectures
- Trigger and Data Acquisition
- High Level Triggers
- Event Building and Fast Networks
- High Speed Synchronous Control
- Online Processing Farms
- Online Databases
- Controls and Monitoring Systems
- Emerging Real Time Technologies
- New standards (ATCA, etc)

TARGET AUDIENCE

- Particle, Nuclear Physics and Astrophysics
- Nuclear Fusion
- Accelerator
- Medical Physics
- Space
- General Radiation Instrumentation



CONTACT

Office of RT 2010
Instituto de Plasmas e Fusao Nuclear
Av. Rovisco Pais
1049-001 Lisboa, Portugal

Phone: +351 21 841 7818
Fax: +351 21 841 7819
e-mail: rt2010@ipfn.ist.utl.pt

PARALLEL SESSION

Tutorials and ATCA Workshop

2010 Lisbon



Bruno Consalves & Carlos Varandas



Stefan Ritt
CANPS Chair

First mini Oral sessions

The modern age (2012 -2020)

			Chair	CANPS Chair	Award
2012	RT-18	Berkeley (US)	S. Zimmermann	Stefan Ritt	Chris Parman
2014	RT-19	Nara (JP)	M. Nomachi	M. Purschke	Chen Yi Chi
2016	RT-20	Padova (IT)	A. Luchetta	M. Purschke	Roger Lecomte
2018	RT-21	Williamsburg (US)	David Abbot	M. Grossmann	T. Friedian
2020	RT-22	Quy Nohn (VN)	Stefan Ritt	M. Grossmann	J.P. Martin

- HEP & NP , upgrades, non accelerator ,XFEL, Fusion,,Medical
- Fast front end electronics
- Emerging technologies
- Software trigger ,GPU,
- Machine learning

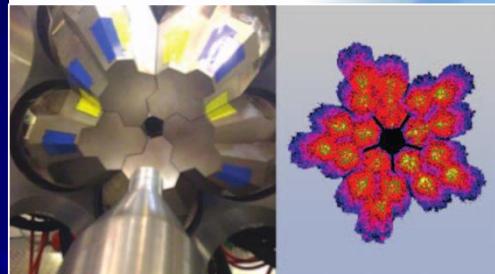


18th REAL-TIME CONFERENCE

2012

June 11-15, 2012, Berkeley, CA

An interdisciplinary conference –
realtime data acquisition
and computing in the
physical sciences
applications.



Gamma Ray Energy Tracking In-Beam Array
(GRETTINA)

RT2012.lbl.gov

Sponsors:



19 OCT 2020

E-mail: RT2012@lbl.gov

Hosted by: Lawrence Berkeley National Laboratory,
a national laboratory operated by the University
of California for the U.S. Department of Energy

Location: Hotel Shattuck Plaza, Berkeley, CA



CS22170
AIMO presentation

2012 Berkeley



*Sergio Zimmermann
Chair*



2012 Berkeley



Chris Parkman award



Napa valley excursion



Students awards

Real Time Conference

May 26th(Mon)-30th(Fri), 2014

Nara Prefectural New Public Hall, Nara, Japan

APPLICATIONS INCLUDE

High energy physics, Nuclear physics,
Astrophysics and astroparticle physics,
Nuclear safety, Medical physics, Space instrumentation,
Nuclear power instrumentation, Radiation safety and security,
General radiation instrumentation

TOPICS

Fault and fault diagnosis, Radiation system architecture,
Intelligent signal processing,
Fault detection, diagnosis and software,
Trigger systems, Data acquisition,
Processing farms, Control, monitoring and test systems,
Upgrades, Emerging radiation technologies,
New standards, Radiation safety and security,
Feedback on experience, Radiation modeling.

WORKSHOP/TUTORIAL/SCHOOL

Before the conference: Workshop and Tutorial in Nara

After the conference: School for Radiation safety

ORGANIZERS

General Chair
Masaharu Nomachi, Osaka University
Executive Committee
Takeshi Taki, ICNP
Masaharu Nomachi, ICNP, Osaka University
Shigeru Ito, RIKEN
Yoshioke Ito, RIKEN
Takao Ueda, JINR
Patrick Le Cal, EPNC Lyon
Dipanjan Chanda, University of Hyderabad

Local Engineering Committee Chair
(Masaharu Nomachi, ICNP, Osaka University)

<http://rt2014.rnnp.osaka-u.ac.jp/>



Masaharu Nomachi
Chair

Indico ?

19 Oct 2020

2014 Nara



AMU presentation



1st Remote tutorial



19 Oct 2020
Senior Award

AMU presentation

Students Awards

... and the 1st School on Real-Time Systems

The collage includes:

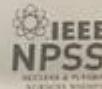
- A green banner with white text: "International school on real-time systems in Osaka 2-7 June 2014".
- A photograph of a green printed circuit board (PCB) with several gold-plated SMA connectors on the left side.
- A screenshot of a software interface showing a waveform on a grid, with a green line and a red line, and some text at the bottom.
- A large group photograph of approximately 30 people, mostly young adults, standing outdoors in front of a modern building with large glass windows and a brick facade.
- A vertical sidebar menu on the left with a green background and white text:
 - Home
 - Program
 - Laboratory Exercises
 - Lectures
 - Application
 - VISA
 - Local
 - Key Dates
 - Organization
 - RT2014 Conference

20th IEEE-NPSS REAL TIME CONFERENCE

06-10

JUNE

2016



PADOVA - ITALY

Deadline for abstract submission: 14 FEBRUARY 2016

TOPICS

Power plant control systems, Real time system architecture, Real time signal processing, Real time control, Data and networks, Power systems, Data acquisition, Real time diagnostics, Processing farms, Control, monitoring and test systems, Upgrades, Emerging real time technologies, New standards, Real time safety and security, Feedback on experiences, Realtime simulation.

APPLICATIONS INCLUDE

High energy physics, Nuclear physics, Astrophysics and astroparticle physics, Nuclear fusion, Medical, Space instruments, power instrumentation, Realtime security and safety, General radiation instrumentation.

<http://www.igi.cnr.it/rt2016>
email: rt2016@igi.cnr.it



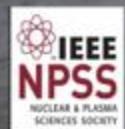
*Adriano Luchetta
Chair*



*Martin Purschke
CANPS Chair*



**20th IEEE Real Time Conference
5-10 June 2016 - Padova**

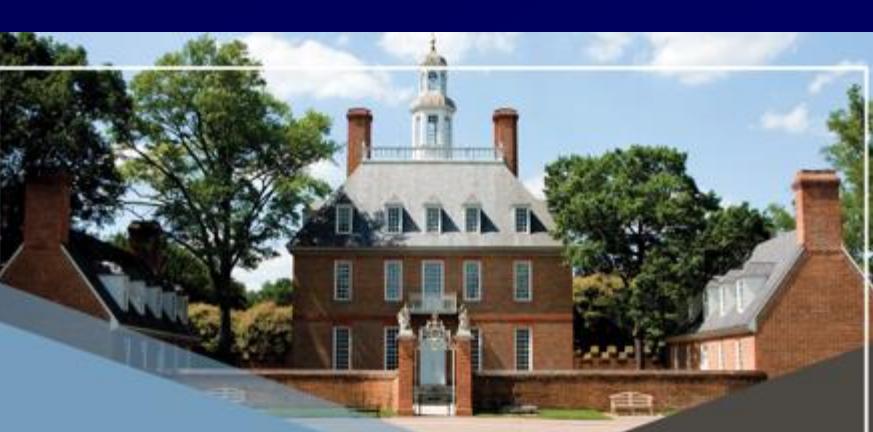


Padova 2016 University plenary session

*Senior Award
Roger Lecomte*



Student Awards



JUNE 11-15,
2018

21ST IEEE REAL TIME CONFERENCE

Colonial Williamsburg, Virginia - USA

APPLICATIONS:

High Energy Physics, Nuclear Physics, Nuclear Fusion,
Nuclear Power Instrumentation, Astroparticle and
Astro-Particle Physics, Space Instrumentation, Medical
Physics, General Radiation Instrumentation, Realtime
Security and Safety.

TOPICS:

- Emerging Technologies
- New Standards
- Data Acquisition
- Upgrades
- Feedback on Experiments
- Control, Monitoring, Test and Real Time Diagnostics Systems
- Trigger Systems
- Real Time System Architectures and Intelligent Signal Processing
- Fast Data Transfer Links and Networks
- Front End Electronics and Fast Digitizers
- Processing Farms
- Real Time Simulation

WORKSHOP/TUTORIALS:

JUNE 9-10, 2018

ORGANIZERS:

GENERAL CHAIR:

David Abbott (Jefferson Lab)

EXECUTIVE COMMITTEE:

Martin Grossmann (PSI)
David Abbott (Jefferson Lab)
Martin Purschke (BNL)
Patrick Le Dù (IPN Lyon)
Réjean Fontaine (Université de Sherbrooke)
Zhen'an Liu (IHEP)
Pierre Amoudruz (TRIUMF)
Sacha Schmelzing (CERN)
Christian Bohm (University of Stockholm)
Stefan Ritt (PSI)



Email: rt2018@jlab.org

<https://indico.cern.ch/e/rt2018>

2018

*David Abbott
Chair*



*Martin Grossmann
CANPS Chair*



AMU presentation

2018 Williamsburg



Senior Award



Student Award

First WIE session



CANPS Committee in 2020

Abbott, David, Jefferson Lab
Amaudruz, Pierre-André, Triumf
Bohm, Christian, University Stockholm
Calvet, Denis, CEA Saclay
Drake, Gary, Argonne
Erickson, Keith, Princeton
Fontaine, Rejean, Université Sherbrooke
Fox, Ron, Michigan State UNiversity
Goncalves, Bruno, IPFN Lisbon
Grossmann, Martin, Paul Scherrer Institut
Hai, Vo Hong, Vietnam National University
Huffer, Mike, SLAC
Itoh, Ryosuke, KEK
Jezynski, Tomasz, DESY
Kuehn, Wolfgang, Uni Giessen
Larsen, Ray, SLAC
LeDû, Patrick, CEA Saclay (retired)
Levinson, Lorne, Weizmann Institute

Liu, Ted, Fermilab
Liu, Zhen'An, IHEP Beijing
Luchetta, Adriano, Consorzio RFX, Euratom ENEA
Makowski, Dariusz, Lodz University of Technology
Neufeld, Niko, CERN
Nomachi, Masaharu, Graduate school of science
Paoletti, Riccardo, University of Siena and INFN Pisa
Purschke, Martin, Brookhaven National Laboratory
Rehlich, Kay, DESY
Ritt, Stefan, Paul Scherrer Institute
Schmeling, Sascha, CERN
Shu, Yantai, Tianjin University
Tang, Fukun, University of Chicago
Tetrault, Marc-Andre, Harvard
Varela, Joao, CERN
Vega, Jesus, EURATOM/CIEMAT
Wu, Jin-Yuan, Fermilab
Zimmermann, Sergio, LBNL



*Martin Grossmann
Canps Chair*

- ## 36 'appointed' Members
- 14 North America
 - 16 EU /R8
 - 6 Asia

Conclusions

- I enjoyed very much to be part of this adventure over the last 27 years
- I met a lot of incredible people
- RT is a great 'small' human conference with a lot of opportunities for young people to participate to the organisation