

2000 IEEE BIPOLAR / BICMOS CIRCUITS AND TECHNOLOGY MEETING



**PROCEEDINGS OF THE 2000
BIPOLAR/BiCMOS CIRCUITS AND
TECHNOLOGY MEETING**

**SPONSORED BY
IEEE ELECTRON DEVICES SOCIETY**

**IN COOPERATION WITH
IEEE SOLID-STATE CIRCUITS SOCIETY
IEEE TWIN CITIES SECTION**

September 24-26, 2000

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Welcome from the Chairmen

Welcome to the 2000 IEEE Bipolar/BiCMOS Circuits and Technology Meeting. As we enter the new millennium, the state of Bipolar/BiCMOS circuits and technology is strong. We believe that this is reflected by another exciting technical program highlighting ongoing advances in bipolar circuits and technology.

BCTM will offer a short course on Sunday, September 24, entitled "Basic Building Blocks for RF BiCMOS Process Technology: Process Integration, ESD, Reliability, and Passives" that will be given by four instructors from academic institutions and industry. ESD protection networks in communications ICs will be discussed by Dr. Eugene Worley from Conexant Systems. Dr. Vu Ho from Nortel Networks will address "Reliability of SiGe Bipolar Transistors: Hot Carrier Injection and Electro-Migration," followed by Prof. John Long from the University of Toronto on "Integrated Passive Components and RF/MMIC IC Design." Prof. Peter Ashburn will close the short course by discussing "SiGe Heterojunction Bipolar Technology."

Being the first BCTM for the new millennium, the technical program committee has put together a forward-looking program. In keeping with this, the keynote speech this year will be delivered by Prof. Mark Rodwell of the University of California, Santa Barbara, entitled "Bipolar Transistor ICs: 50GHz and Beyond."

Else Kooi, retired director of Philips Research Labs in the Netherlands and now living and working in the US as a consultant for semiconductor technology, will present this year's luncheon speech. The title, "On the Evolution and Creation of Parasites," certainly gives room for speculations about the content of this presentation.

This year there will be a total of 12 technical sessions, including 9 invited talks. Once again we feature an excellent mix of both academic and industrial papers from around the world, covering all aspects of bipolar technology. As for many years now, conference participants will be asked to vote for the best student paper. The award will be presented at next year's conference.

New this year will be a special session "New Technology Directions," in which three widely recognized experts will provide their views on disciplines that may in the future become relevant to bipolar and BiCMOS technologies.

There will be one panel discussion. Six industry leaders from process/technology and design/systems will discuss the advantages and disadvantages of being vertically integrated versus fabless in a session entitled, "Will the Future RFIC Companies be Fabless?"

We express our appreciation to the 2000 BCTM committee members for their diligence in assembling an exciting program. It is our great pleasure to extend to you a hearty welcome to the 2000 IEEE Bipolar/BiCMOS Circuits and Technology Meeting in Minneapolis.

Achim Burghartz
BCTM 2000 General Chair

Kenneth O
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BCTM EXECUTIVE AND PROGRAM COMMITTEES

BCTM EXECUTIVE COMMITTEE

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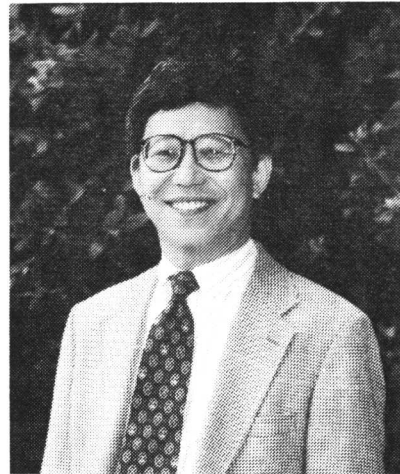
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General Chair



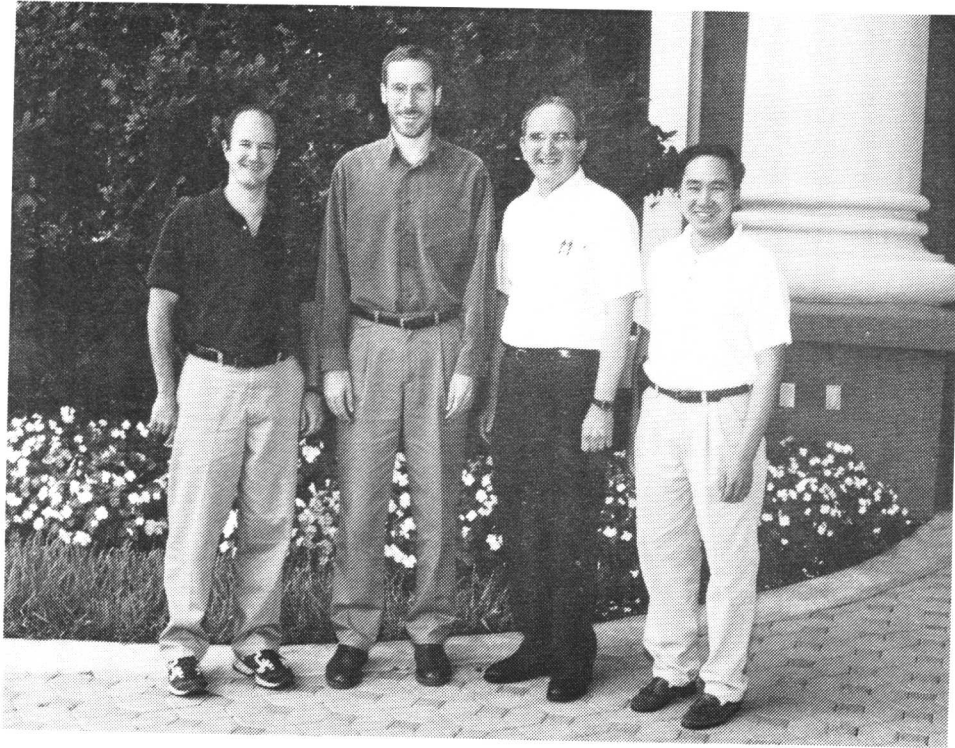
Kenneth O
Program Chair

Executive Committee



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Back row, l. to r.: A. Burgartz, J. Long, P. Zampardi, Y.-F. Chyan, C. McAndrew

RF Committee



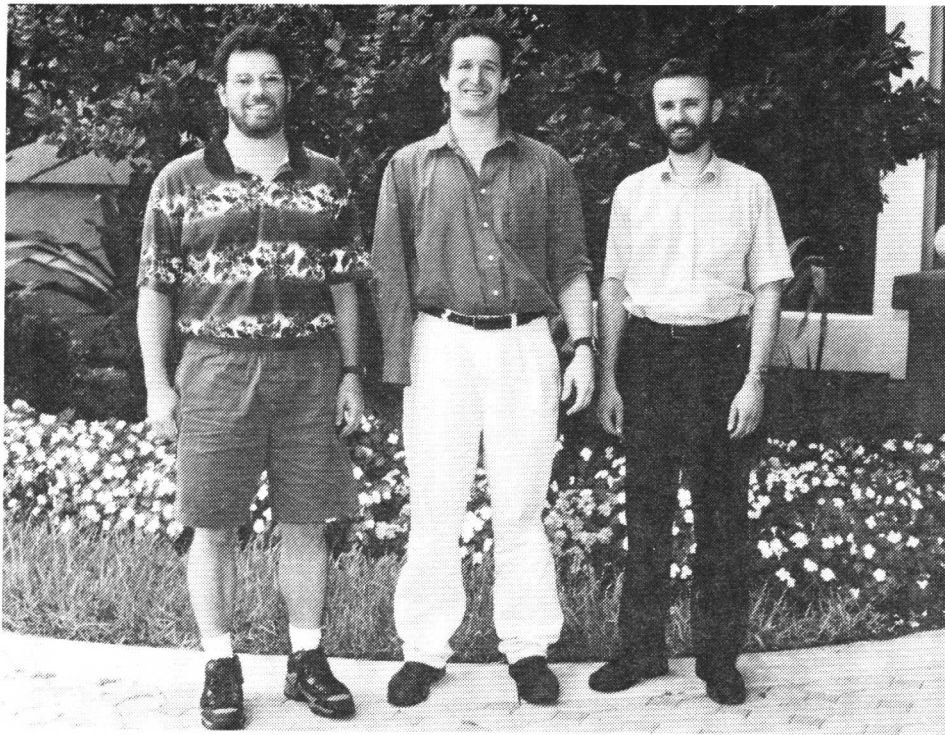
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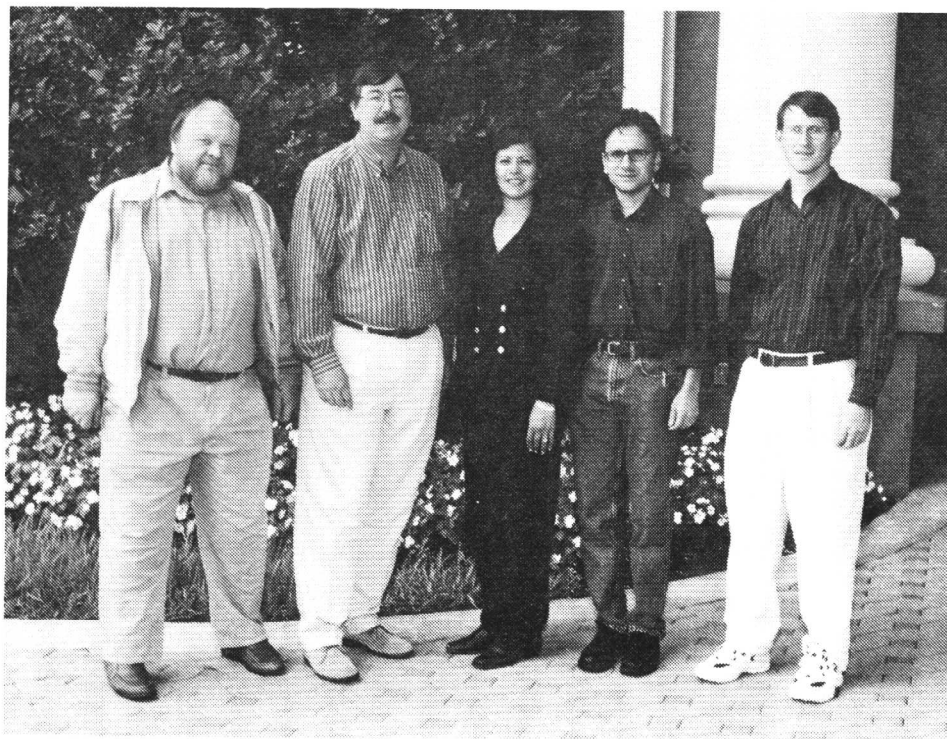
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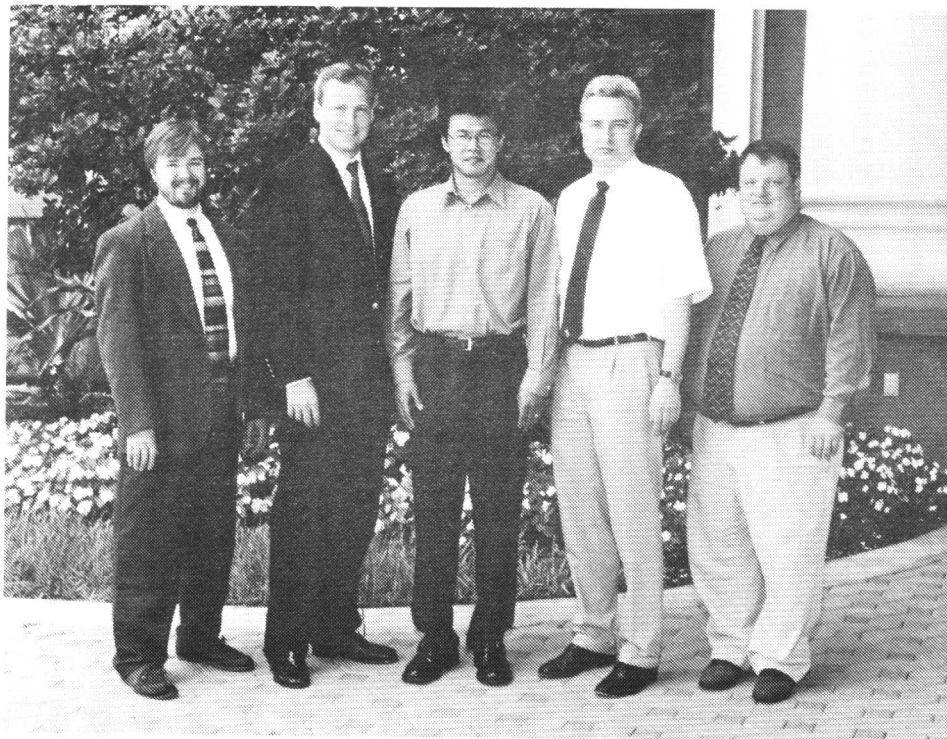
L. to r.: P. Zampardi, C. King, J. Hamel

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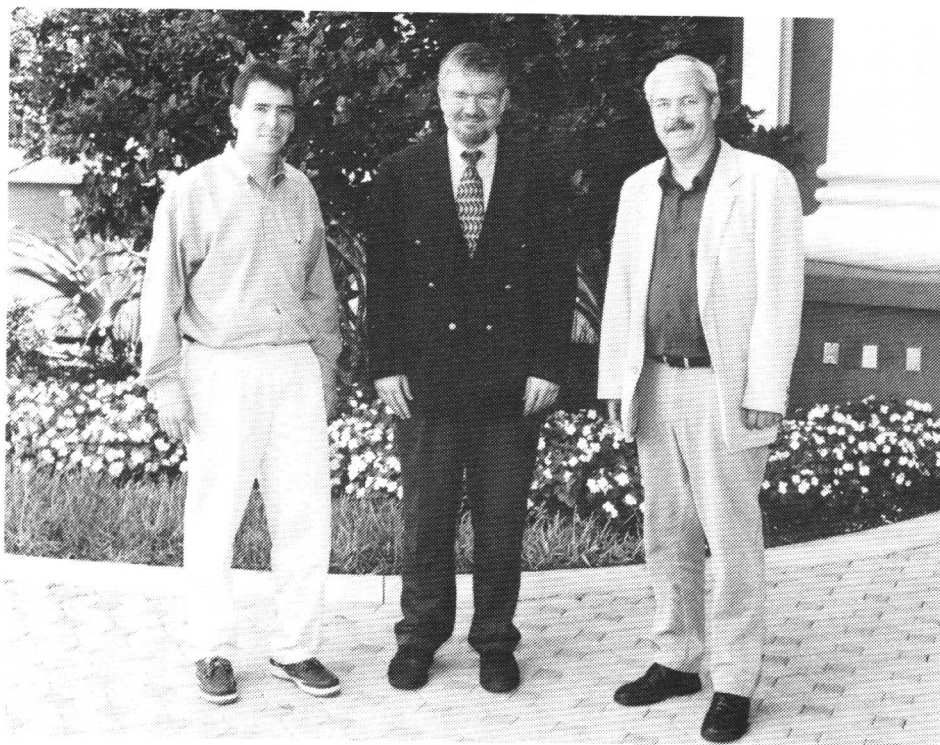
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L. to r.: J. Parker, C. McAndrew, J. Berkner

2000 BCTM

SCHEDULE AT A GLANCE

Sunday — September 24

8:45 AM — 5:15 PM	SHORT COURSE Basic Building Blocks for RF BiCMOS Process Technology
7:30 PM	Registration/Reception

Monday — September 25

Registration open from 7:30 AM in Ballroom Atrium			
8:00 AM	Opening Remarks and Announcements		
8:15 AM — 9:00AM	Keynote Speaker Prof. Mark Rodwell Bipolar Transistor ICs: 50GHz and Beyond Ballrooms 1 and 2		
9:00 AM	Coffee and Cookies in Ballroom Atrium #		
9:20 AM — 11:00 AM	Emerging Smart Power Technologies Ballroom 3	Wireless Circuits Ballroom 4	
11:00 AM	Visit Vendor Exhibitions		
11:30 AM	Lunch + Luncheon Speaker: Dr. Else Kooi Ballrooms 1 and 2		
1:20 PM — 3:00 PM	Advanced BJT Modeling Ballroom 3	Analog and Digital Circuit Design Ballroom 4	
3:00 PM	Coffee in Ballroom Atrium		
3:20 PM — 5:25 PM	Novel Power Devices Ballroom 3	Communication Technologies Ballroom 4	PA Device Physics Ballroom 1
Author Interviews Immediately After Sessions			
Dinner Break			
7:45 PM	Complementary Refreshments in Atrium		
8:00 PM	Panel Session Will the Future RFIC Companies be Fabless? Ballroom 3		

Tuesday — September 26

8:00 AM — 10:15 AM	Special Session: New Technology Directions Ballrooms 1 and 2	
10:15 AM	Coffee Break in Ballroom Atrium *	
10:30 AM — 12:10 PM	RF Building Blocks Ballroom 3	BJT Modeling and Parameter Extraction Ballroom 4
12:10 PM	Lunch / Exhibitors Reception in Atrium	
1:50 PM — 3:55 PM	RF Components Ballroom 3	Topics in HBT Technologies Ballroom 4
Author Interviews Immediately After Sessions		

#Sponsored by Texas Instruments, Inc.

*Sponsored by IBM Microelectronics

CALL FOR PAPERS

2001 BIPOLAR/BI-CMOS CIRCUITS AND TECHNOLOGY MEETING MARRIOTT CITY CENTER HOTEL -- MINNEAPOLIS, MN

<http://ectm.et.tudelft.nl/www/BCTM/>

Short Course: September 30, 2001, Conference: October 1-2, 2001

The Bipolar/BiCMOS Circuits and Technology Meeting (BCTM) provides a forum for technical communication focused on the needs and interests of the bipolar and BiCMOS community. Papers covering the design, performance, fabrication, testing and application of bipolar, BiCMOS and BiFET integrated circuits, bipolar phenomena, and discrete devices are solicited. All papers must be suitable for a twenty minute presentation. Text and figures must not have been presented at other conferences or published in any scientific or technical publications prior to BCTM.

CONFERENCE HIGHLIGHTS

- Short course
- Evening panel discussions on future challenges and controversial issues
- Several invited papers on new directions in Bipolar/BiCMOS technology including emerging technologies
- Presentation of the 2000 Best Student Paper Award
- Vendor exhibits
- CD-ROM complimentary with registration

PAPERS IN THE FOLLOWING AREAS OF BIPOLAR/BI-CMOS CIRCUITS AND TECHNOLOGY ARE SOLICITED:

ANALOG/DIGITAL CIRCUIT DESIGN: Analog ICs - Digital ICs - Mixed analog/digital ICs - Novel design concepts and methods - DACs and ADCs - Amplifiers - Integrated filters - Communications ICs - Sensors - Gate arrays - Cell libraries - Analog master chips - Analog subsystems within a VLSI chip - Packaging of high-performance ICs.

RADIO FREQUENCY CIRCUIT DESIGN: Low noise amplifiers - Automatic gain control - VCOs - Active mixers - Active gyrators - Power amplifiers - Switches - Noise suppression techniques - Frequency synthesizers - Radio subsystems - Packaging of RF components - Designing with integrated passive components at RF frequencies.

DEVICE PHYSICS: New device physics phenomena in Si, SiGe, and III-V devices - Profile design issues and scaling limits - Hot electron effects and reliability physics - Non-equilibrium transport and high field phenomena - Low-frequency noise - Linearity/Distortion-Novel measurement techniques.

MODELING/SIMULATION: Improved BJT and HBT models - Behavioral modeling techniques - Parameter extraction methodologies and test structures - RF and thermal simulation techniques - Modeling of passive components, interconnect and packages - Statistical modeling - Device, process and circuit simulation.

PROCESS TECHNOLOGY: Advances in processes and device structures demonstrating high speed, low power, low noise, high current, high voltage, etc. - BiCMOS processes - Advanced process techniques - Si and Si-C homojunction bipolar/BiCMOS devices, III-V and SiGe heterojunction bipolar/BiCMOS devices - Fabrication of high-performance passive components including MEMs.

POWER DEVICES: Discrete and integrated bipolar/BiCMOS power devices, RF power devices and high-voltage ICs - Automotive electronics, disc drives, display drives, power supplies, electric utility, medical electronics, motor controls, regulators, amplifiers, converters and aerospace electronic applications - BiCMOS circuits for controlling power devices - CAD and modeling of power devices - Packaging of power devices.

STUDENT PRESENTATION OF PAPERS ENCOURAGED

BEST STUDENT PAPER AWARD: Papers presented by students and based upon their own work will be considered for the Best Student Paper Award if the abstract is identified as a student paper at the time of submission. The award presentation will be made at the 2002 BCTM.

PRE-CONFERENCE PUBLICITY

The accepted summaries will be used for publicity purposes and portions of these abstracts may be quoted in pre-conference magazine articles publicizing the conference. If this is not acceptable, authors must contact Janice Jopke.

FURTHER INFORMATION

BCTM is sponsored by the IEEE Electron Devices Society, in cooperation with IEEE Solid-State Circuits Society and the IEEE Twin Cities Section. All questions or inquiries for further information regarding this conference should be directed to the Conference Manager, Janice Jopke (CCS Associates, 6611 Countryside Drive, Eden Prairie, MN 55346 - TEL (952) 934-5082 - FAX (952) 934-6741 - E-mail: prairie66@uswest.net). The 2001 Conference Chair is Kenneth O, University of Florida, Gainesville, FL. The Technical Program Chair is Hiroshi Iwai, Tokyo Institute of Technology, Yokohama, Japan.

EXHIBITS BCTM welcomes exhibits by design, test/measurement, and CAD/modeling vendors related to the topics covered by the conference. Please contact Janice Jopke - TEL 952-934-5082 for details.

If you know of people who may have a paper to contribute and have not received this Call for Papers, please bring it to their attention.

IMPORTANT DEADLINES FOR AUTHORS

- | | |
|------------------------|---|
| Friday, March 16, 2001 | Receipt of abstract and summary |
| Monday, May 14, 2001 | Notification of acceptance to be mailed |
| Friday, July 6, 2001 | Receipt of proceedings manuscript |

PREPARATION OF ABSTRACT AND SUMMARY

Authors must submit 55 copies each of a 35 word factual abstract and a summary in English which define their twenty minute presentation to: Janice Jopke, CCS Associates, 6611 Countryside Drive, Eden Prairie, MN 55346, USA - TEL 952-934-5082, FAX 952-934-6741, E-mail: prairie66@uswest.net.

Abstract and Summary must include:

- 1) Title of presentation
- 2) Principal author name, affiliation, complete address, telephone number, FAX number, and e-mail address
- 3) Person to whom correspondence should be sent if other than principal author
- 4) Identification as regular, invited or student paper
- 5) Suggested area (Analog/Digital Circuit Design, RF Circuit Design, Device Physics, Modeling/Simulation, Process Technology, Power Devices) in which their abstract fits
- 6) A 35 word factual abstract which will be used to describe subject matter of accepted papers in the Advance Program
- 7) A summary of the work to be presented at the conference

The summary should clearly state:

- i) The purpose of the work
- ii) The manner and degree to which it advances the art
- iii) Specific results which have been obtained and their significance

Please note that authors may submit an abstract and a summary electronically instead of the hard copies to: Janice Jopke: prairie66@uswest.net. (use this address for E-submission)

They are to be prepared as instructed above and submitted in PDF format. Electronic submission other than PDF format is not acceptable. The deadlines are the same as submitting the hard copies.

The summary will consist of up to three pages of text on normal letter-size paper with at least 2 cm margins on all sides and at least 10 point type font and a fourth page of figures, drawings and photos. All pages of each copy (abstract/summary) should be stapled together as a single document. Those submitting are urged to give a complete account of the work in the context of its application. The most common causes of rejection are lack of specific results, insufficient description for the work to be understood and omission of data showing realization of the concept. The factual abstract is not used in paper selection. Its only use is in the Advance Program booklet. Abstracts may be edited without consultation to accommodate the Advance Program format. The abstract should be factual without arguments or claims, and contain 35 or fewer words. The factual abstract goes on the first page of the summary, immediately following the title/author block; each copy of abstract/summary should be stapled.

The authors of accepted contributed papers will receive an author kit that will include instructions on preparation of an extended abstract of no more than four pages (including figures) for the Proceedings and CD-ROM of the 2001 BCTM. Publication of an Extended Abstract does not preclude a fuller account in an IEEE journal, and authors are encouraged to do so.

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Co-chair: Leo de Vreede

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Co-chair: Peter Zampardi

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Co-chair: Colin McAndrew

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H. Knapp, J. Böck, M. Wurzer, G. Ritzberger, K. Aufinger, L. Treitinger (Infineon, Germany)

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B. Ray, J. Hamel, T. Manku (Univ. of Waterloo, Canada), J. Nisbet (Stanford Microelectronics, Canada)