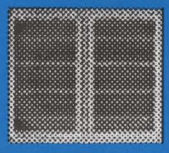
IEEE

Solid-State Circuits



Newsletter

Volume 1, Number 2
April 1996

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The Institute of Electrical and Electronics Engineers, Inc.

Feature Article

Notice of Administrative Committee Election Call For Nominations

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Chair, Nominations Committee
FAX: (802) 769-9659

On February 17, the Technical Activities Board of the IEEE approved the Constitution of the new Solid-State Circuits Society. Final approval by the Executive Committee is expected in June. Our Constitution now moves onto the fast track, for implementation in January of 1997. As specified in the Constitution, there will be an election THIS FALL for new Administrative Committee (AdCom) members.

Where Will The Candidates Come From?

A Nominations Committee is presently being formed to encourage recognized people in our field to run for election to the new AdCom. However, that is not the only possible source for potential candidates. Our new Constitution both allows and encourages candidates by petition.

A petition requires ten recognizable signatures of pro-tempore members of the Solid-State Circuits Society for validation and inclusion on the ballot. Most other Societies require many more signatures.

continued ...

Who Can Run For Election? Who Can Vote?

For the purposes of the first election, pro-tempore members of the new Society are defined as subscribers to the Journal of Solid-State Circuits. If you are now a subscriber to the Journal you are both a qualified voter and a potential candidate for election to the Solid-State Circuits AdCom.

Terms of Office

Five new members to the AdCom need to be elected this Fall. The term of office is three years beginning in January of 1997. Re-elected AdCom members may serve a second consecutive term but not a third.

As with any new enterprise, the span of duties is difficult to forecast. The precursor organization, the Solid-State Circuits Council, meets twice a year and transacts a lot of the intervening business by phone and e-mail. As new activities are added, the new AdCom will probably need to meet more frequently. Attendance at all meetings is expected; and the Constitution has provisions for removing members who miss two consecutive AdCom meetings. AdCom members can expect to do a moderate amount of homework between meetings.

IEEE SOLID-STATE CIRCUITS NEWSLETTER
is published by the
Institute of Electrical and Electronics Engineers, Inc.,
345 E 47 Street, New York, NY 100117

Charles W. Gwyn, Editor 505-844-5154
John H. Wuorinen, Publisher 207-326-8811

The Business Of The AdCom

The Administrative Committee will have immediate oversight responsibility for the Journal of Solid-State Circuits, the International Solid-State Circuits Conference, the Solid-State Circuits and Technology's special workshops, and all conferences symposia and workshops for which it will be a co-sponsor. These currently include the Custom-Integrated Circuits Conference and the Symposium on VLSI circuits. A more complete description of these activities appears in the February issue of the Newsletter. The AdCom also sets memberships fees and manages the Society's finances. The AdCom may also sponsor chapters and choose to initiate or encourage other new activities that it believes to be in the interest of members of the Society.

Elections

IEEE elections do not resemble the rough and tumble activity of state and national elections. They are competitive, however, so not all candidates will be elected. We expect to have about twice as many candidates as vacancies to fill. Ballots will be mailed to all Journal subscribers in the Fall of this year along with brief résumés of the candidates.

Nominees by Petition

Nominees will automatically be placed on the ballot providing:

- The nominee is presently a subscriber to the IEEE Journal of Solid-State Circuits.
- The petition is supported by ten identifiable signatures of present subscribers to the Journal of the Solid-State Circuits.
- The nominee is both aware of and agrees to the petition.
- The petition is received by the Chair of the Nominations Committee by May 22, 1996.

All petitions should be accompanied by a short biography of the nominee (100 words or less) including areas of interest. Petitions must be received by May 22, 1996. Mail petitions to:

W. David Pricer
RR#1 Box 1689,
Charlotte, VT 05445

Message From The President

Robert G. Swartz r.swartz@ieee.org
President, IEEE Solid-State Circuits Council

A new professional society is coming your way - the IEEE Solid-State Circuits Society (SSCS). It is an outgrowth of the efforts of the people who bring you the ISSCC, the Journal of Solid-State Circuits, the Symposium on VSLI Circuits, and other technical meetings and journals.

Events have been moving very quickly. About 5 months ago, the IEEE Technical Activities Board (TAB) approved the formation of a new society to represent the interests of the integrated circuit designer. In February of this year, TAB approved the name, IEEE Solid-State Circuits Society, for the society, and also its Constitution and Bylaws. These are available for your perusal at the SSCC website at *http://www_sscc.eecg.toronto.edu/* Check it out. In June, we hope to clear the final hurdle - approval by the IEEE Executive Board.

This year witnesses a change at the helm of ISSCC. Since 1988, Mr. David Pricer has served as Chair of the Executive Committee of ISSCC. Under his direction and leadership the Conference has added many new features. Among these are:

- Expanded Plenery Session
- Slide Supplement containing a complete visual record of talks
- Topical Short Courses
- Tutorials taught by Program Committee members
- Added Short (Concept) Papers to Program
- Sessions on Emerging Technologies
- Hotel Coupon to reduce financial uncertainty
- Addition of Overseas members to Program Committee
- More Sessions and Papers
- East/West Coast and Tokyo Press Conferences
- World-Wide-Web Page
- Conference Vision Committee
- CD-ROM version of Conference Digest and Slide Supplement
- A Social Hour
- Jack Kilby Outstanding Student Paper
- Expanded Conference Budget

Dave Pricer has performed standout service as Chairman for nine years, and now passes the leadership of the ISSCC on to John Trnka, a standout leader who has served previously as a member of the ISSCC Program Committee, as Program Committee Chair, and as Solid-State Circuits Council representative to ISSCC. We look forward to his continued advancement of the Conference. Mr. Pricer continues his involvement with the new Solid-State Circuits Society as Chair of the Nominations Committee.

The Solid-State Circuits Society is actively seeking nominations for members of its governing board. Elsewhere in this Newsletter, you will see from Dave Pricer a Call for the Nomination of Administrative Committee Members, and instructions on how to nominate or be nominated. The last day for nominations for this year's elections is May 22, 1996.

This fall, we will hold elections for five new members of the Administrative Committee. If you are presently a member of the IEEE and subscribe to the Journal of Solid-State Circuits, then you will receive a ballot. Please plan to vote!

Later, you will receive your usual renewal notice from the IEEE. But something will be different. You will find the new Solid-State Circuits Society (SSCS) there on your enrollment form. We want you to enroll.

The SSCS will provide links to your technical peers while working for your professional advancement. It will offer you opportunities to become involved in our profession both within and outside of the workplace.

Enrolling as a member will provide the support that we need to continue improving the conferences and journals that you care about, offer new services, and represent your interests in the IEEE.

In the next issue of this Newsletter, we will give more details on the enrollment. In the meantime, we hope that you find this communication of interest and value. If you

have suggestions for articles of interest or improvements, please contact me or the Newsletter Editor, Chuck Gwyn.

New on the World-Wide-Web!

John Trnka trnka@vnet.ibm.com
ISSCC Executive Chair

The Solid-State Circuits Council (Society) is maintaining a home page on the World-Wide-Web at *http://www_sscc.eecg.toronto.edu/* This page can also be accessed from the "IEEE Technical Societies" reference at the IEEE home page *http://www.ieee.org/* and then selecting "Solid-State Circuits Council."

A copy of this newletter as well as previous ones can be viewed directly on the WEB by selecting the "Newsletter" under "Publications" from the SSCC homepage.

A new section titled "Society Development" is also available under "About the Council". This section includes some introductory material and a copy of the recently adopted "Constitution" and "Bylaws" of the new Society. An evolving banner for the Society is also displayed on this page. Suggestions on the banner are welcome.

Updates to meeting calendars will be provided in the near future.

Forming Local CHAPTERS

Paul Jespers jespers@dice.ucl.ac.be
Region 8 Representative to the Solid-State Council

The creation of CHAPTERS was not a prerogative of the Solid-State Circuits Council. However, with the Council becoming a SOCIETY, it is possible to establish Solid-State Circuits Chapters.

What is a CHAPTER? What is its mission and what are the challenges in establishing successful CHAPTERS? How is a CHAPTER created and is the relationship between CHAPTERS and the other IEEE units? Answers to those questions are contained in the following discussion.

CHAPTERS

IEEE bylaw 406.1 states that "A CHAPTER is a technical subunit of one or more SECTIONS constituted by a minimum of twelve members of a SOCIETY and established by petition to the parent unit(s) and concerned SOCIETIES to represent and fulfil the needs of the members and the missions of IEEE."

CHAPTERS have two parents: a SECTION and a SOCIETY, or eventually more than one SECTION and/or SOCIETY. Being subunits of a SECTION, CHAPTERS reflect the specific field of interest of their members. A SOCIETY may be far removed physically, while a SECTION offers immediate proximity. CHAPTERS hold technical meetings and seminars. SECTIONS and CHAPTERS support decentralized SOCIETY activities. There are almost 900 CHAPTERS around the world.

CHAPTER relationship to the SOCIETY

The SOCIETY seeks to identify and satisfy the needs of the CHAPTERS and SECTION members and to formulate plans to meet those needs. It provides a strong technical resource for the CHAPTERS, included educational programs (courses, speakers, etc.). The SOCIETY has a CHAPTER coordinator and CHAPTERS have representation on the SOCIETY Government Board (IEEE Policy and Procedures manual - Jan., 1990, Section 9).

CHAPTER relationship to the SECTION

The Section assists Chapters in organizing, developing management procedures, securing and electing officers, planning and implementing meetings and programs and funding CHAPTER operations. While CHAPTERS function for a smaller circle of interest, possibly with its own bylaws, they are a functional part of the SECTION. A CHAPTER functions in a manner similar to that of a committee of the SECTION and has a voice in the SECTION.

A CHAPTER is not a closed club; it needs to grow and expand and may sponsor meetings or

events which are of interest to other members of the SECTION. IEEE meetings are open to all, including nonmembers.

The Chairman and members of the Executive Committee of the SECTION assist in executing the mission of the CHAPTER:

1) by providing adequate funding (e.g. seed money)
2) by disseminating notices of meetings
3) by integrating CHAPTER plans with those of the SECTION
4) by supporting the CHAPTER relationship with the SOCIETY
5) by treating the CHAPTER as an important and integral SECTION unit

How a CHAPTER is formed

A petition signed by not less than twelve SECTION members, above Student grade, who are members of the SOCIETY must be submitted to the SECTION Executive Committee for approval, via the SECTION secretary. Since signatures are required, the formation of a new CHAPTER will not be approved until a hard copy of the petition is submitted by the Organizer. It is suggested that more than the specified number of names and signatures be included to assure that all petitioners qualify, thus speeding the petition process.

The petition shall specify the names of the SECTION, SOCIETY and the name and address of the CHAPTER organizer. The petition, along with approval by the SECTION Executive Committee, shall be mailed to:

IEEE Regional Activities
Section/Chapter Support.
445 Hoes Lane
P.O. Box 1331 (Attn: Peggy Kovacs)
Piscataway, N.J. 08855 - 1331
(908) 981 - 0060, FAX (908) 981 - 0027

The establishment of the CHAPTER is complete after the Regional Activities Board has ascertained that the Regional Director and the SOCIETY President(s) have no objections to the formation of the CHAPTER. Following approval, the SECTION Chairman, the CHAPTER Organizer, the Regional Director and the President of the SOCIETY will be notified.

Once created, a minimum of two CHAPTER programs per administrative year is required to remain viable - one may be joined with a SECTION meeting).

More information can be found in the brochure prepared and produced by the Joint Chapters Committee, IEEE Regional Activities Board and IEEE Technical Activities Board: *IEEE Society: Section - Chapter Interactions.*

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Message from the Editor

Charles W. (Chuck) Gwyn
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As the volunteer Newsletter Editor, I welcome your participation in the new Society activities. Our first newsletter distribution was delayed because of complications in understanding the printing and distribution system and our goal to distribute the first Newsletter at the February ISSCC. I indicated in the first Newsletter that our publication schedule would be somewhat irregular, but we have decided to publish four issues this year--February, April, August and November. Most of the articles will deal with the formation of the new Society including mechanics, goals and objectives. Initially, we intend to distribute the Newsletter with the IEEE Journal of Solid-State Circuits and later through separate mailings. As we become organized, we will develop a Logo for the Society, a unique look and format for the Newsletter, and a procedure for including special articles in the publication. I solicit your suggestions and help in making the Newsletter meet your needs and in optimizing communcations within the Society membership.

1996 International Solid-State Circuits Conference

Frank W. Hewlett hewletfw@sandia.gov
ISSCC96 Program Committee Chair

The 1996 ISSCC technical program was the largest in the 43 year Conference history, reflecting both the strength of our industry and the efforts of a proactive Program Committee. New benchmarks in many circuit specialties showed dramatic performance improvements over previous record highs. Among the many notable benchmarks were a 433MHz microprocessor, 200Mb/s disk drives, 128Mb Flash memories, and 16b 1MSample/s pipelining ADC.

Attendance was the highest in the past 12 years, approaching 3000, with authors representing 15 countries. Extra sessions were added to several tutorials to accommodate more than 1200 participants. The CMOS imagers workshop attendance was limited by space requirements. Two sessions of the Digital TV short course were required. For the first time, attendees will receive a complimentary CD ROM version of the Slide Supplement combined with the ISSCC'96 Digest.

System-on-a-Chip was the 1996 Conference theme. Advancements in solid-state circuits and technology enabling single-chip-systems were the focus of attention. The Plenary session opened the Conference on February 8, 1996. The three Plenary talks highlighted System-on-a-Chip developments in the Far East, the Americas and Europe. System performance, power, portability and cost advantages achievable in monolithic form were described in each Plenary presentation and approximately 25% of the technical papers. Mixed-signal-system power supply issues and the System-on-a-Chip interconnect challenge were addressed by industry experts during evening panel discussions.

The first Plenary presentation offered a vision of ubiquitous multimedia. Dr. Hajime Sasaki of NEC Corporation proposed a Multimedia Complex-on-a-Chip as the key to open the door to a Multimedia World. Dr. Sasaki currently serves as the first Executive Director of the Semiconductor Industry Research Institute of Japan (SIRIJ), founded in 1994 as an industry think tank. He examined the architectures and technologies required to realize a 500M transistor, 1TOPS Multimedia Complex-on-a-Chip with high-capacity, high-bandwidth embedded DRAM. He explored the power management techniques at device, circuit, and architectural levels required to meet portable multimedia requirements. As the SIRIJ Executive Director, he shared a unique insight into the international cooperative R&D required to realize a Multimedia-Complex-on-a-Chip in the year 2010.

Multimedia products and services create demand for a compact, low-cost, low-power camera. In the second Plenary presentation, Bryan Ackland of AT&T Bell Laboratories employed a standard CMOS technology and active pixel matrix architecture to realize a Camera-on-a-Chip. The key advantage of this approach is monolithic integration of camera timing, control and signal-processing circuitry with the active-pixel sensor array.

Together with progress in plastic lens technology, this Camera-on-a-Chip has potential to meet the demand at a cost in the $20 range. Applications for these cameras span a vast array of products from multimedia PCs, automobiles, and home appliances to imaging systems for planetary spacecraft. In addition to the Plenary, numerous papers in multiple sessions reflected the breadth of the CMOS image sensor work.

Today's consumer TV market and product requirements drive development of a One-chip TV - the ultimate integration of a standard definition TV receiving system. The One-chip TV performs all signal processing between the tuner output and the input of the power amplifiers of the display and sound systems. In a third plenary presentation, Leo Nederlof, Consumer Product Development Manager of Philips Semiconductors, Nijmegen, The Netherlands reviewed the market and product characteristics guiding selection of circuits and technology for the One-Chip TV. He shared a vision of the semiconductor industry in the System-on-a-Chip era in which semiconductor component suppliers acquire and maintain system knowledge necessary to develop systems-on-a-chip. As system knowledge increasingly resides with the supplier, the supplier becomes a system house.

Reported ISSCC'96 technology advancements are the basis of important industry trends. CMOS technology met the performance and density requirements of RF circuits, image sensors and ATM/SONET systems increasing the variety of circuit functions that can be monolithically integrated. Multi-level-metal DRAM technology realized monolithic systems requiring high-capacity, embedded memory. Results were high-bandwidth communication with the memory and reduced power dissipation. DRAM technology was used to implement an ATM switching system, a RISC machine, and image processor each with multi-Mb embedded DRAM. The 1Gb DRAM reported at ISSCC'96 may well become the technology driver for development of future System-on-a-Chip technology. In the past, divergence of DRAM and logic fabrication process development was driven by DRAM cell size and logic interconnect requirements. DRAM technology used to realize monolithic systems is a paradigm shift for the semiconductor industry. For example, SEMATECH plans 0.18μm, six-level metal logic technology in production by the year 2000. DRAM technology is excluded from the plan.

Multimedia applications are driving System-on-a-Chip developments impacting all circuit disciplines. Portable multimedia, desk-top multimedia and video teleconferencing are driving development of mediaprocessors, multimedia DSPs, CMOS imagers, a TFT liquid-crystal display, ΣΔ converters, and embedded memory - Flash; SRAM; DRAM. A Multimedia Signal Processing paper session, the Electronic Imaging panel, and Computer Multimedia panel rounded out the Conference's multimedia events. This multimedia digitization thrust was punctuated by analog-signal-processing examples offering performance, cost or system simplification advantage.

Analog signal processing was selected for the One-Chip TV, 200Mb/s read channel disk drive, and 2-D array processor.

This year's program featured 156 technical papers, 3 Plenary presentations, and 8 Evening Panels in a Thursday-Friday-Saturday format. Both the number of papers submitted and accepted represent all time record highs over the 43 year Conference history. For the first time, five parallel sessions each day (4 on Saturday morning) were required to accommodate the increased number of papers. One-half of the papers were from North America and one-half from the Far East and Europe underscoring the international scope. Multi-national corporate R&D partnering blurred the geographical origin of many contributions. As the foremost global forum for presentations of advancements in solid-state circuits, the ISSCC is the diffusion source for technology globalization.

The response to last year's survey indicates that attendees come to ISSCC to learn more about circuit detail in a chosen field. A high percentage are interested in CAD and DFT from the standpoint of a circuit designer. The Program Committee developed the 1996 program to meet this educational need: six Tutorials offered introductory material to specific paper sessions; the Digital TV Short Course provided a jump start for engineers in transition to this important field; a CMOS Imagers Workshop offered a forum for experts to discuss current R&D; and full Paper Sessions were devoted to circuit detail in the communications and digital design specialties.

All speakers were asked to include brief introductory slides to put the presented work into perspective with the state of the art and background material covering innovative CAD or design methodology supporting the chip's development. The Social Hour and 8 Evening Panels offered an opportunity to network and exchange information. The ISSCC has returned to its roots in circuits and technology as the "Education Conference." Participation is essential to the continuing education of engineers working at the leading edge of IC design.

Meetings Calendar

Charles G. Sodini sodini@mtl.mit.edu

Custom Integrated Circuits Conference
May 5-8, 1996
San Diego, CA
Contact: Melissa Widerkehr 301-527-0900

Symposium on VLSI Technology
June 10-13, 1996
Honolulu, HI
Contact: Melissa Widerkehr 301-527-0900

Symposium on VLSI Circuits
June 13-15, 1996
Honolulu, HI
Contact: Melissa Widerkehr 301-527-0900

Nonvolatile Memory Technology
June 24-26, 1996
Albuquerque, NM
Contact: Bill Brown 501-575-6045

European Solid-State Circuits Conference
September 17-19, 1996
Neuchâtel, Switzerland
Contact: Philippe Aubert 41-38-205-428

ASIC Conference
September 23-27, 1996
Rochester, NY
Contact: Lynne Engelbrecht 716-254-2350

Workshop on Selected Topics in IC Design
September 30, 1996
Dana Point, CA
Contact: Stan Schuster 914-945-1191

International Solid-State Circuits Conference
February 6-8, 1997
San Francisco, CA
Contact: Diane Suiters 202-639-4255

Symposium on Low-Power Electronics & Design
August 12-14, 1996
Monterey, CA
Contact: Diane Suiters 202-639-4255

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