



EDITOR: *H.J. Kuno*

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OUTGOING PRESIDENT'S MESSAGE

by Don Parker

"BECOMING INVOLVED"

People frequently like to categorize mankind. For example, I have a friend who says there are two types of people in the world: those that understand interest and those who don't. Those who understand interest, collect it; and those who don't, pay it.

It seems to me that in the engineering profession there are three types of people; those who become involved in making things happen, those who stand by and find fault with what is happening, and those who seem to have no interest at all in what's happening. Leo Young, the new President of IEEE is a prime example of one who has made it his business to become involved. Leo has devoted countless hours to the MTT Society, to Division IV, and to the IEEE at a National level. I know from personal experience the intensity with which he has worked. Leo's example is difficult to equal; however, he has shown that commitment and perseverance can bring about change.

Many have devoted untold hours for the betterment of our society, but I mention Leo in particular because he along with Al Clavin was instrumental in getting me involved in the MIT ADCOM in the early seventies. Now as my term of office as President of MTT-S comes to a close, I would like to encourage more of our membership to become involved in the activities of the society and our profession. Support of the local chapter meetings is a good beginning. Most chapters need willing workers to help plan meetings and activities and to serve as committee members and officers. Our annual symposium is always sponsored by a local chapter and demands the talents of several dedicated people in the local area. Also the symposium technical program committee draws upon the abilities of experts throughout the industry. At the national

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1980-1981 MTT-S NATIONAL LECTURE

by Robert A. Pucel

"MONOLITHIC MICROWAVE CIRCUITS; TECHNOLOGY, APPLICATIONS, AND FUTURE PROSPECTS"

Monolithic microwave integrated circuits based on silicon-on-sapphire (SOS) and gallium arsenide technologies are being considered seriously as viable candidates for satellite communication systems, airborne radar, and other applications. The low-loss properties of sapphire and semi-insulating GaAs substrates, combined with the excellent microwave performance of metal-semiconductor FETs (MESFETs), allows, for the first time, a truly monolithic approach to microwave integrated circuits. By monolithic we mean an approach wherein all passive and active circuit elements and interconnections are formed into the bulk, or onto the surface of the substrate by some deposition scheme, such as epitaxy, ion implantation, sputtering, evaporation, and other methods. The importance of this development is that microwave applications such as airborne phased array systems based on a large number of identical circuits and requiring small physical volume and/or light weight, may, finally, become cost effective.

The lecture will cover in some detail the design considerations that must be applied to monolithic microwave circuits in general, and to gallium arsenide circuits in particular. The important role to be played by dual gate FETs will be discussed. The talk also will give numerous examples of monolithic circuits and components which illustrate the design principles. A glimpse into the future prospects of monolithic microwave circuits will be made.

(Continued on page 10)



MICROWAVE CAREER AWARD

Seymour B. Cohn

For a career of meritorious achievement and outstanding technical contribution in the field of microwave theory and techniques.

Seymour B. Cohn (S'41 — A'44 — M'46 — SM'51 — F'59) was born in Stamford, Conn., on October 21, 1920. He received the B.E. degree in electrical engineering from Yale University in 1942, and M.S. and Ph.D. degrees in engineering sciences and applied physics from Harvard University in 1946 and 1948, respectively.

From 1942 to 1945 he was employed as a Special Research Associate by the Radio Research Laboratory of Harvard University, and also represented that laboratory as a Technical Observer with the U.S. Air Force. From 1948 to 1953 he was with Sperry Gyroscope Company, Great Neck, N.Y., where he advanced to the position of Research Engineer. From 1953 to 1960 he was with the Stanford Research Institute, Menlo Park, Calif., as Head of the Microwave Group and from 1957 as Manager of the Electromagnetics Laboratory. In 1960 he joined Rantec Division, Emerson Electric Company, Calabasas, Calif., as Vice President and Technical Director. In 1967 he formed S. B. Cohn Associates, Inc., and since that date has practiced as an independent consultant to various companies in the microwave industry.

Dr. Cohn is a member of Tau Beta Pi and Sigma Xi. In 1954 he received the Annual Award for the Advancement of Basic and Applied Science given by the Yale Engineering Association. He is a former member and ex-chairman of the G-MTT Administrative Committee, and was the recipient of the G-MTT 1964 Microwave Prize. He is an Associate Editor of the *Microwave Journal*, and a member of the Editorial Board of the *Advances in Microwave* series published by the Academic Press. In 1974 Dr. Cohn was given the Lamme gold medal, which is one of the six major annual awards of the IEEE.



MICROWAVE CAREER AWARD

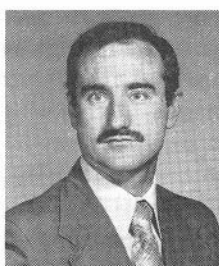
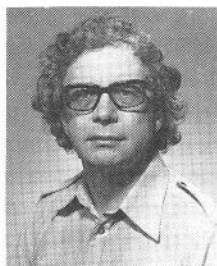
Werner J. Kleen

For contributions in developing modern microwave tubes and their theory and in introducing advanced microwave technology into the European space effort.

Werner J. Kleen studied Physics at the Universities Hannover, Göttingen and Heidelberg, 1931 Dr. phil. nat., 1936 Dr. habil. He was working until 1946 at Telefunken, Berlin, 1946/50 at CSF, Paris, 1950/52 at the Instituto Nacional de Electrónica, Madrid, 1952/67 at Siemens AG, where he finished as Director of the Research Laboratory in Munich. For 1968/71 he was elected Director of the European Space Research and Technology Centre (ESTEC) of Noordwijk, Netherlands of ESRO (now ESA). Dr. Kleen taught at University of Munich, University of Madrid, Technical University of Stockholm and Chalmers University of Goeteborg. He is author and coauthor of many publications and several books on classical and microwave electron tubes. Awards Dr. Kleen has received are Plague of Svenska Teknolog Foereningen, Gauss-Weber Medal of the University, Göttingen; Honorary Professor at the Technical University, Munich; Ring of Honour of the Verband Deutscher Elektrotechniker (VDE). In 1957 he was elected Fellow of IEEE.



MICROWAVE PRIZE



E. R. Carlson M. V. Schneider T. F. McMaster

For paper "Subharmonically Pumped Millimeter-Wave Mixers" IEEE Trans. on Microwave Theory and Techniques, vol. MTT-26, pp. 706-715, October 1978.

Eric R. Carlson (M'73) was born in Celveland, Ohio, on August 26, 1941. He received the B.S., M.S., and Ph.D. degrees in physics from Yale University, New Haven, CT, in 1963, 1965, and 1972, respectively.

From 1972 to 1973 he was a Research Staff Physicist at Yale University, and in 1973 he joined the Radio Physics Research Department at Bell Laboratories, Crawford Hill, in Holmdel, N.J. He has worked primarily on circuits and solid-state devices for millimeter-wave receivers in the 100-300-GHz frequency range and the applications of these receivers in radio astronomy and upper atmospheric measurements.

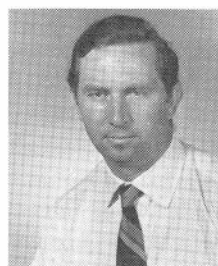
Dr. Carlson is a member of the American Physical Society.

Martin V. Schneider was born in Bern, Switzerland. He received the Diploma in Physics and the Doctorate in Natural Sciences from the Swiss Federal Institute of Technology, Zurich, Switzerland in 1956 and 1959, respectively.

From 1959 to 1961, he was a research assistant at the Swiss Federal Institute of Technology and in 1961 he joined the Radio Research Laboratory at Bell Laboratories, Inc. in Holmdel, New Jersey. He has worked on thin film solid-state devices and circuits, Schottky barrier photo-detectors and microwave and millimeter-wave integrated circuits. He is presently engaged in advanced work on millimeter-wave devices and circuits for use in communication receivers and for remote sensing.

Dr. Schneider is a Visiting Professor of Electrical Engineering at the University of Virginia, a Fellow of the IEEE and a member of the Editorial Board of MTT. He has been actively engaged in IEEE matters by serving as MTT Group Chapter Chairman and as Section Chairman for the New Jersey Coast Section of the IEEE. He enjoys hiking in his spare time and he has gone on extended bicycle trips along the canals of Burgundy and Nivernais in France.

Thomas F. McMaster (M'77) was born in New York City, New York in 1944. He received the B.S.E.E. degree from Drexel University, Philadelphia, Pennsylvania, in



MICROWAVE APPLICATION AWARD

Erwin F. Belohoubek

For pioneering the concepts and practical implementations of internal matching of microwave transistors.

Erwin F. Belohoubek received a Diplom-Ingenieur degree in 1953 and a PhD in Electrical Engineering in 1955 from the Technical University in Vienna, Austria. From 1953 to 1955 he worked as a Research Assistant at the Institute for High-Frequency Techniques at the Technical University.

In 1956 he joined the RCA Tube Division in Harrison, New Jersey, as Research Engineer and, in 1957, transferred to the David Sarnoff Research Center, in Princeton, as a Member of Technical Staff, where he worked on the development of magnetrons, electrostatically and magnetically focused traveling-wave tubes, and a crossed-field microwave delay tube.

In 1969 Dr. Belohoubek was put in charge of a group working on microwave hybrid integrated circuits. Currently, as Head of Microwave Circuits Technology at the Microwave Technology Center, he is responsible for the development of passive and active MIC circuits, including high-power transistor amplifiers, multipliers, linear bipolar and FET amplifiers, active microwave filters, various solid-state radars, and other microwave subsystems. He received an Outstanding Performance Award from the RCA Electronic Components Division in 1963 and an RCA Laboratories Achievement Award in 1967.

Dr. Belohoubek holds eight patents and has written more than 25 papers in the areas of microwave techniques, traveling-wave tubes, and microwave integrated circuits. He is a Fellow of IEEE.



MICROWAVE PRIZE (Cont'd)

1972, and the M.S.E.E. degree from the Polytechnic Institute of Brooklyn, Brooklyn, New York in 1974.

He joined Bell Laboratories in 1972, where he has worked on the development of millimeter-wave mixers and waveguide components, long-haul coaxial cable communication systems, and satellite communication systems. He is presently the supervisor of the Domestic Satellite Design Group in Holmdel, New Jersey.

Mr. McMaster is a member of Eta Kappa Nu and Phi Kappa Phi.

HIGHLIGHTS OF ADCOM MEETING

NOVEMBER 8 & 9, 1979
ST. LOUIS, MO.

by Fred Rosenbaum

One of the responsibilities of the ADCOM vice president is to report to the membership on the happenings at ADCOM Meetings, the decisions made and the directions taken by your organization. The incoming president, Stephen Adams has asked me, as incoming VP, to begin my reporting with the Fall ADCOM Meeting which was held in St. Louis in early November.

This was an unusual meeting in several respects: Typically, ADCOM meets three times a year: in January, at the site of the International Symposium, in the Spring, at the Symposium itself; and the annual meeting in September at a candidate site for a future symposium. A fourth meeting was called, not for any special or pressing reason, but to finish up the business of the year in an unhurried fashion and to take time to debate some of the issues that confront ADCOM and the MTTS membership. St. Louis was chosen for its central location and its cheap hotel rooms.

We gathered for dinner on Thursday night and the meeting was called to order afterwards.

President Don Parker presented his opening remarks and reported on authorized actions taken since the previous ADCOM. These included numerous correspondence items; letters of congratulations to new ADCOM members society award winners, etc. The report of L.K. Anderson, IEEE Division IV Direction was read into the minutes. Since this was recently reprinted in the Fall 1979 Newsletter, it will not be commented on here.

The Society's financial position is strong, according to Treasurer J. E. Deginford. His report shows that our estimated cash balance projected to 31 Dec. 1979 should be \$212.1 K. This is about the same as our current annual operating budget. After some discussion it was moved and passed that we instruct IEEE Headquarters to increase our cash reserve investment in high yield instruments; Eurobonds are being used for this purpose by Headquarters. Degenford also reported that the Transactions budget is \$137K and that voluntary page charges are presently being honored on 60% of the chargeable pages.

A motion on a request by Fred Rosenbaum was submitted by Steve Adam. In order to function effectively within the IEEE framework it is necessary for the MTTS president to attend Technical Activities Board (TAB) meetings, held periodically around the country. Since many other groups and societies have two year terms for their

presidents they have been perceived as having an inside track in dealing with TAB since they have a chance to learn more about its operations and can make contact. This is more difficult for our MTTS president whose term is only one year. One approach is to extend the term of the MTTS president. Another approach is to ask the vice president to attend TAB meetings along with the president. This will enable him to develop an understanding of TAB so that, if elected MTTS president, he will be in a position to work for MTTS's best interest. Since this request puts a burden on Fred's travel funds (only partly supported by his institution) he requested travel support for TAB meetings. After much discussion a \$1500 budget was granted by ADCOM.

The Membership Services Committee, under Dick Sparks has worked very hard to improve communications with the local chapters. ADCOM has adopted an approach whereby each ADCOM member is to act as liaison for two local chapters. Dick reported that membership seems to be up about 6-7% over last year.

The National Lecturer was discussed, and his travel fund allocation was increased in light of higher air fares and the heavy speaking schedule needed to accommodate the numerous chapters who have invited him. Publishing a paper based on the lectures is highly desirable since it provides good tutorial material for the Transactions, it highlights the National Lecturer, and it gives us an archival record of technology development. Our National Lecturers have been requested to submit their manuscripts so that they can appear in an issue in the year of their lectureship. Topics for the 1980-1981 National Lecture were also discussed along with some potential candidates. A selection is to be made at the January ADCOM.

Barry Spielman described a one day symposium on "Advanced Radar Systems Technology" to be presented at Westinghouse, Baltimore, on 3 May 1980. He mentioned that the symposium could be presented elsewhere if suitable arrangements were made. Fred Rosenbaum reported for the Non-Periodic Publications Committee that the two IEEE pressbook proposals had been forwarded to IEEE headquarters for review.

G. P. Rodrique complemented Dick Sparks for his dedicated work as Membership Services Chairman. Steve Temple was also singled out for praise regarding his work in membership and chapter activities.

Prior to adjournment, MTTS awards were discussed. Erwin Belohoubek of RCA was nominated for the Microwave Applications Award and Dr. Kleen of Germany was likewise proposed for a Microwave Career Award, by Prof. G. P. Rodrique, on behalf of the Awards Committee. After spirited discussion a vote was taken and the committee recommendations were unanimously accepted. Congratulations to the new Awardees.

Pete also reported that 16 Fellow nominations were reviewed by his committee and that the decision of Headquarters would be forthcoming in December, 1979.

The meeting was recessed at 11:00 p.m. and reconvened at 8:15 a.m., the morning of 9 November.

Harlan Howe, Chairman of the meeting and Symposia Committee, moved to accept the report of the 1979 Symposium, and added his congratulations to the Symposium Committee for an outstanding job. MTTS netted more than \$57K from this important activity. ADCOM wishes to thank Rudy Henning and his fine coworkers for the magnificent symposium they use on our behalf.

Larry Whicker reported on plans for the 1980 Symposium in Washington. The exhibits are going well with 106 booths already sold. He also described plans for the banquet which promises to be one of the most memorable ever. Updates on future Symposia were also presented.

A rather complete report on the 1979 Submillimeter Conference was presented by Ken Button and much discussion ensued. This conference has been supported and encouraged by the MTTS ADCOM which sees the goals of the submillimeter community as being closely allied to those of MTTS. In fact, many MTTS members are engaged in millimeter and submillimeter work and it is clear that this is a technology area of vital interest to MTTS. ADCOM was glad to see such studies being made by the conference and is seeking ways to continue and expand its support of this activity.

The next agenda item dealt with the Transactions. Editor Reinhard Knerr reported on the healthy state of the Transactions and on his intention to reinstitute the classification of paper, short paper, and correspondence item since both authors and reviewers tend to view papers in this way. With a clear cut statement as to the distinctions between these categories Knerr felt that his work, that of the reviewers, and the authors themselves would be much facilitated. A long and vigorous discussion followed and it was finally agreed to follow the Editor's recommendations. The status of special issues was also discussed.

Jerry Aukland presented the report of the Bylaws and Procedures subcommittee of the Operations Committee. He had been instructed to prepare a bylaw amendment to change the duration of the MTTS ADCOM president's and vice president's terms from one year to two years, as briefly mentioned before. Again there was vigorous discussion regarding the most beneficial and efficient way to govern MTTS. After much useful debate, Jerry was requested to draw up a record bylaw change, this time addressing an organization with two vice presidents and one president, each with a one-year term, but with the prospect of one person serving for three years, progressing in the leadership. The detailed duties under such an arrangement are to be worked out and presented at the January ADCOM. At that time both bylaw changes will be debated and presumably the issue will be resolved. Also at that meeting a detailed review of ADCOM's voting method in elections will be made. This stemmed from the difference in opinion regarding the definition of plurality in our bylaws which occurred at the September elections.

The Publicity and Public Relations report was made by committee chairman Bert Berson. He presented to ADCOM the initial results of his efforts to generate a membership and recruiting brochure for MTTS. He was commended for his efforts and authorized to proceed with the idea. The agenda returned to awards with Pete Rodrique leading the discussion on ways in which we can honor significant contributors to our field. One idea being circulated by John Horton is a "Microwave Hall of Fame"; some type of on-going display which could be exhibited at the Symposium to keep alive the names and contributions of those whose work helped the field develop the way it has. More discussion will be forthcoming at the January meeting.

ADCOM also heard reports from our representatives to the Solid State Circuits Council, COMAR, the Professional Activities Committee, Telecommunications Policy and Energy. A film for TV, and a "Nova", has been suggested to COMAR to explore non-ionizing radiation to the public and to examine the case for microwave hazards. ADCOM moved to endorse COMAR in this effort.

New business was introduced by Harlan Howe who suggested that ADCOM acknowledge the election of Les Young as IEEE president. Les was once MTTS ADCOM president. A telegram was dispatched congratulating one of our most illustrious alums.

After lunch, the entire session was devoted to long range planning issues. In the next year we hope to examine the question of recruiting and training entry-level engineers for the microwave field, how universities can help industry and vice versa, and how to continue our attempts to attract timely applications papers for the Transactions. We will explore means of drawing closer to the submillimeter community, and of increasing the efforts of the Technical Committees to stay abreast of areas of MTTS interest and to stimulate these areas.



History of MTT

by Ted Saad

ADCOM VIII, JULY 1, 1959 THROUGH JUNE 30, 1960

Administrative Committee:

A. A. Oliner, Chairman
K. Tomiyasu, Vice Chairman
S. W. Rosenthal, Secretary-Treasurer

T. N. Anderson	R. C. Hansen	G. Shapiro
R. E. Beam	W. W. Mumford	G. Sinclair
A. C. Beck	W. L. Pritchard	P. D. Strum
A. G. Clavier	T. S. Saad	M. C. Thompson
S. B. Cohn	R. F. Schwartz	R. D. Wengenroth

Ex-Officio	Honorary Life Member
H. F. Engelmann	George C. Southworth

Transactions Editor
Donald D. King

The Chairman of the eighth ADCOM was Art Oliner and the Vice Chairman was Kiyo Tomiyasu. Saul Rosenthal was in his second year as Secretary-Treasurer, Don King continued as Editor of the Transactions and Gus Shapiro was still the Newsletter Editor.

One matter of concern for that and other ADCOMs was the Annual Review. The review was a summary of all the microwave papers appearing in Journals throughout the world. Because of the effort involved in preparing a comprehensive review of all of the major U.S. and foreign publications, it was difficult to find volunteers willing and capable of supplying the information. There was discussion during the year about discontinuing the practice, but the reviews and the discussions continued.

As interest in the Transactions and the Annual Symposium increased, microwave papers submitted for presentation at the IRE National Convention decreased. At the 1959 MTT Symposium, a survey was made to determine the types of papers attendees would prefer to have presented at the National Convention. Sixty-two people preferred invited papers only, twelve opted for contributed papers only, and 192 felt that both invited and contributed papers would be desirable. Some ADCOM members felt that a form of summary discussion would be helpful, either by the Chairman of the session or by an invited speaker at the session. However, the ultimate decision for stimulating the microwave sessions at the IRE National Convention was left up to the Meetings Committee Chairman. But the fact remained that interest in the National Convention, by microwave people, was diminishing rapidly.

An activity that appeared to be gaining in popularity was the presentation of lecture series by the local chapters. A lecture series on Microwave Antenna Theory and Techniques was held by the New York Chapter of MTT during the early part of 1960. The Boston Chapter also had a six week lecture series at about that time devoted to the general subject of microwaves.

Don King as Transactions Editor proposed, and the ADCOM approved, the increase in Transactions Issues from four to six each year. This began in January of 1960. The ADCOM was assured that the new policy would also result in an expedited printing schedule that would significantly reduce the time between when an author submits a paper to when he would see it in print.

During the 1960 period, there appeared to be concern about the increasing cash balance in the treasury and there were many discussions devoted to the question of how to put the money to work most effectively. One recommendation was for some type of subsidization for technical publications sponsored by IRE and others. Another idea was to hire temporary help for the National Symposium Committee in the form of a professional manager. Still another was to hire part-time help for the Transactions Editor. It was agreed that all of these matters would be examined.

After soliciting the local chapters relative to their interest in the 1961 National Symposium, indications of interest were received from Long Island, Washington, D.C., Baltimore and Boulder, Colorado. The ADCOM, after considering the four applications, selected Washington, D.C. as the site for the 1961 Symposium.

At one of the ADCOM meetings, there was a discussion about the possibility of publishing all of the Symposium papers, without prior review, in a special issue of the Transactions to be for distribution at the Symposium. However, because of the concern for quality of technical content and the insistence on a review process, the proposal was tabled.

One of the highlights of the year was the naming of Dr. Andre G. Clavier an Honorary Life Member of the PGMTT Administrative Committee.

The microwave prize for 1959, which was presented in May of 1960 at the Annual Symposium, was awarded to Bert A. Auld for his paper entitled "The Synthesis of Symmetrical Waveguide Circulators" which was published in the April 1959 MTT Transactions.

Advertising was still coming in at an improved rate under the guidance of Tore Anderson. He asked for and received approval from the ADCOM to charge companies \$210.00 for six institutional listings in the Transactions. Tore had done such an effective job selling ads in the Transactions, the finances of the ADCOM were in excellent condition. As of May 31, 1960, the Treasurer reported a cash balance of \$23,340.47.

CALL FOR NOMINATIONS TO ADMINISTRATIVE COMMITTEE

by R. B. Hicks

The attendance at the San Diego Symposium was 584. The meeting was held at the Hotel Del Coronado which was situated on a peninsula between San Diego Bay and the Pacific Ocean. It was the first time that the Annual Symposium had been held in an isolated area where the attendees were able to intermingle with one another with few outside distractions. In a questionnaire that was distributed at the Symposium to determine the memberships' reaction to the meeting, the comments were generally favorable and, despite the misgivings of having a symposium in an area which was not necessarily a center of microwave activity, it proved to be a complete success.

With the continued interest in, and the growing importance of the Annual Symposium, a motion was passed which required the Symposium Committee to write a final report within two months of the end of the Symposium. The report was to include a financial statement as well as any other information which might be of help to future Symposium Committees.



All MTT members should note that they may assist the Nominations Subcommittee in obtaining nominees for the 1981 ADCOM member election. MTT members may enter a MTT society member's name as a nominee, by mailing a petition for that nominee with 25 society members' signature to me, or the ADCOM President, prior to our annual meeting in September 1980.

The bylaws of MTT-S state that the Nominations Subcommittee should select a slate of at least two members of the Society for each vacancy which occurs on the Administrative Committee on January 1 of each year. Each nominee is contacted to assure his willingness to serve and his ability to attend ADCOM meetings. Nominees by the Nominations Subcommittee are selected by the principles of efficiency, geographical, and organization distribution. Elections of the nominees are made by members of the ADCOM not eligible for re-election at that time.

This year we will elect six (6) 3 year term members. The hold over members will be geographically divided as follows: East (4), Central (3), Southeast (2), Pacific (3).

Incumbants who may stand for re-election are geographically located as follows: East (3), Pacific (3).

It may also be of interest to consider that the present ADCOM is composed of twelve (12) members from industry, four (4) members from universities and non-profit organizations and two (2) from government agencies. Members whose term expires are distributed as follows: industry (4), universities and non-profit organizations (1) and government agencies (1).



EDITOR'S NOTE

By H. J. Kuno

A number of MTT members sent in letters in response to **Al Clavin's** Guest Editorial on pensions. In fact we received so many that only a representative few could be published (see Fall 1979 issue). Interestingly, all disagreed with the Editorial. We thank all of you who took the time to express your views.

For the first time a non-U.S. member has been named co-recipient of the Microwave Career Award. Congratulations to **Werner Kleen** and **Seymour Cohn**, U.S. co-recipients!

As all of you must be aware, our new IEEE President is prominent MTT member **Leo Young**. Leo is the first petition candidate in IEEE history to be elected to the Presidency. Similarly, **Steve March**, who was nominated by petition, was elected to the MTT Adcom. **Walter Gelnovatch** and **Paul Greiling** were also elected to the ADCOM.

All indications are that FET, monolithic integrated circuits, and millimeter-waves will play key roles in the 1980's. Our choice of National Lectures reflects the rapidly growing knowledge and technology in these fields. **Charles Leichti** lectured on FET in 1978/79 and **Jim Wiltse** on millimeter-wave technology in 1979/80. Now, to provide our membership with current background on monolithic microwave integrated circuits, we are calling upon the expertise of **Robert Pucel**, National Lecturer for 1980/81.



NATIONAL LECTURE (Cont'd)

The National Lecture may be scheduled by writing or calling:

Dr. Robert A. Pucel
Raytheon Company
Research Division
28 Seyon St.
Waltham, MA 02154
Tel (617) 899-8400 Ext. 3795

Dr. Robert Pucel received his B.S. and M.S. degrees in 1951 and his D.Sc. degree in 1955, all in electrical communications, from M.I.T., Cambridge, Mass. Both his master's and doctoral dissertations were in the field of network synthesis and the approximation problem of network theory. Dr. Pucel studied under the late Prof. E. A. Guillemin.

In 1955 he joined the Research Division of Raytheon. From 1965 to 1970 he was Project Manager of the Microwave Semiconductor Devices and Integrated Circuits Program. From 1970 to 1973 Dr. Pucel served also as a consultant to the Microwave Transistor Group of the Power Tube Division. In 1974 he was appointed Consulting Scientist, the highest technical level at Raytheon.

His work has involved theoretical and experimental feasibility studies of new semiconductor device concepts and the design of high-frequency semiconductor devices; for example, the tunnel diode, varactor, avalanche diode, Gunn and LSA structures, metal-semiconductor-metal (MSM) diodes, and bipolar transistors. His activities also have included theoretical and experimental studies of microstrip propagation on dielectric and magnetic substrates, thin-film components for microwave integrated circuits, miniature dielectric cavities, and noise and signal properties of field-effect transistors and other microwave semiconductor devices. Presently, Dr. Pucel is responsible for design of monolithic microwave circuits and components.

Dr. Pucel is a Fellow of the IEEE and a member of the MTT-S and ED-S. He is a co-recipient of the 1976 Microwave Prize and a Registered Professional Engineer of the Commonwealth of Massachusetts.



OUTGOING PRESIDENT'S MESSAGE (Cont'd)

level, there are a variety of committees in addition to several Technical Activity Committees. The usefulness and quality of our Transactions is maintained by an extensive cadre of competent reviewers. New people with fresh ideas at all levels are needed to keep the MTT society vital. If you are one of the concerned membership, become involved. Contact your local chapter chairman or write ADCOM.

I am grateful for the opportunities that have been mine the past eight years as a member of ADCOM. I tried to contribute as best I could. In turn, I found that like those who understand interest, I collected a great deal on my investment. You can do likewise.



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