

# NOMINATIONS COMMITTEE CANDIDATES FOR 2001 ACES BoD ELECTION

## GENERAL BACKGROUND

**BRUCE ARCHAMBEAULT** received his B.S.E.E degree from the University of New Hampshire in 1977 and his M.S.E.E degree from Northeastern University in 1981. He received his Ph.D. from the University of New Hampshire in 1997. His doctoral research was in the area of computational electromagnetics applied to real-world EMC problems. In 1981 he joined Digital Equipment Corporation and through 1994 he had assignments ranging from EMC/TEMPEST product design and testing to developing computational electromagnetic EMC-related software tools. In 1994 he joined SETH Corporation where he continued to develop computational electromagnetic EMC-related software tools and used them as a consulting engineer in a variety of different industries. In 1997 joined IBM in Raleigh, N.C. where he is the lead EMC engineer, responsible for EMC tool development and use on a variety of products. During his career in the U.S. Air Force he was responsible for in-house communications security and TEMPEST/EMC related research and development projects.

The candidate has authored or co-authored a number of papers in computational electromagnetics, mostly applied to real-world EMC applications. He is currently an Associate Editor for the IEEE Transactions on Electromagnetic Compatibility. He is also the lead author of the book entitled *EMI/EMC Computational Modeling Handbook*.

## PAST SERVICE TO ACES

The candidate has been serving as a member of the ACES Board of Directors since 1998 and is the current secretary to the Board of Directors. He is heavily involved in the new joint ACES/IEEE EMC Society web page focused on modeling, validation and standard problems. He has served as the Tutorial Editor for the ACES Newsletter, and has recently been named as Editor-in-Chief of the ACES Newsletter.

The candidate has attended most of the ACES Annual Reviews since 1987, and has presented a number of papers through the years.

## CANDIDATE'S PLATFORM

Over my career, I have seen a tremendous increase in the speed of digital electronics, and a resulting increase in both EMC regulations and EMC problems. These increases have caused a real need for software tools to help the practicing EMC engineer. Rules-of-thumb and closed-form equations seldom provide the necessary accuracy for these practical problems. ACES has grown from its initial Method of Moments and military applications concentration to encompass all numerical techniques and a variety of commercial as well as military applications. I believe ACES provides a vital link between the E/M code developers and the user community. I will work to strengthen this linkage between developers and users, and ensure the applications considered are real-world applications.

Applying numerical methods to real-world applications is seldom a trivial task. Identifying the correct source and other model parameters is vital to an accurate result. Towards this end, I feel it is extremely important that ACES be a leader in the education of computational electromagnetic techniques as they apply to real-world problems. Engineers need to understand when it is appropriate to use which computational technique, and when a different technique would provide better or faster results. Thus I will promote activities to help educate practicing engineers in numerical methods from a real-world point of view.

Another critical part of using computational tools is to properly validate the results from the modeling tool. All too often, measurements are assumed to be the only way to validate models, even when the measurement is often full of uncertainty itself. I have been very active to use other methods (in addition to measurements) for model validation. I would plan to continue to push for model validation standards and to educate the user community about various validation techniques and standard modeling problems.

## OTHER UNIQUE QUALIFICATIONS

I have found that it is rare for an individual to possess an understanding of theoretical electromagnetics, computational techniques, and a practical, day-to-day understanding of the real world of test, measurement and design. I feel that my understanding of all three of these areas make me a strong potential resource to add to the other skills already within ACES.

## GENERAL BACKGROUND

**ANDRZEJ KRAWCZYK** has earned three degrees in electrical engineering. He received M.S. and Ph.D. degrees from the Technical University of Lodz, Poland in 1971 and 1977, respectively and a Doctor Habilitate from the Institute of Electrical Engineering, Warsaw, Poland in 1988. His first two thesis topics involved electromagnetic field in electrical machines while the last one was connected with the mathematical and numerical modeling of electromagnetic field. In 1971 he joined the Institute of Electrical Engineering, Transformer Branch in Lodz, where he began developing methods of computational electromagnetics to compute electromagnetic field in transformers. He contributed the iterative approach to the method of integral equation. In 1973 he began the Ph.D. course at the Technical University of Lodz which he finished defending his Ph.D. in 1977. After his doctorate he rejoined the Institute of Electrical Engineering again, but this time he was in the Department of Fundamental Research in Warsaw. In 1981 he stayed for 6 months at the Okayama University, Japan. After that he began investigating the boundary element method (BEM) which led to the completion of his habilitation thesis in 1988; the topic of the thesis was the application of the boundary element method to the simulation of transient problems. He was also the co-author of the BEM package. In 1985 he joined Southampton University for three months where he collaborated with Prof. Percy Hammond on energetic and geometric properties of electromagnetic fields. In 1991 he visited Kanazawa University in Japan where he was investigating the problems of magnetomechanics.

Dr. Krawczyk has authored or co-authored about 90 papers on computational electromagnetics. Recently, since 1995 his papers are mainly connected with the computation of bioelectromagnetic structures. Some of them were published in the IEEE Transactions on Magnetics, COMPEL and post-conference books and special issues of journals. He co-authored (with John A. Tegopoulos, Technical University of Athens) a book entitled *Numerical Modelling of Eddy Currents* published by Oxford University Press in 1993. He also authored several book chapters and edited and co-edited a few special post-conference issues of COMPEL and Journal of Technical Physics. In 1985 he began co-organizing ISEF conferences and since 1991, the Polish-Japanese Joint Seminars. Andrzej Krawczyk is a reviewer for many international journals and conferences. In 1999 he obtained the title of professor which is given by the President of Poland. At present he has the position of professor at the Institute of Electrical Engineering in Warsaw and at the Technical University of Czestochowa. Since 1997 he is the President of the Polish Society of Applied Electromagnetism (elected for second three-year term in 2000). He is also a member of IEEE, ACES and the International Compumag Society.

## PAST SERVICE TO ACES

The candidate's past service to ACES includes reviewing papers for the ACES Journal.

## CANDIDATE'S PLATFORM

The last decades have brought a tremendous increase of the theory and practice of computational electromagnetics. Now, at the turn of century, the methods of computational electromagnetics are approaching perfection, as to the theory and are being sold in commercial packages. Thus, now one looks for practical use of them. Because ACES has played an important role in achieving this high level of the methods, ACES again is expected to play the same role in achieving high level of their practical usage. The area of practical problems is very wide but I would see ACES to help in developing rather new areas of applications, like computation of bioelectromagnetic structures and EMC problems.

In electromagnetic community we have already a few international societies, either formal like International Compumag Society or informal, like those connected with ISEM, ISEF and other conferences. To remain distinguished from existing ones, ACES should, in my opinion, pay attention to the following direction: to develop deep links between all the sciences dealing with applied electromagnetics, like electrical engineering, applied mechanics, applied physics, plasma engineering, biology, material engineering and, last but not least, medicine.

## OTHER UNIQUE QUALIFICATIONS

Coming from a Middle European country, I am in a unique position to promote ACES activity among people from these countries. Also I am strongly connected with other electromagnetic communities and conferences (ICS, ISEF, ISEM) as well as with Japanese experts affiliated with the Japan Society of Applied Electromagnetics and Mechanics which may help in organizing joint activities and reciprocal relationships.

## **GENERAL BACKGROUND**

**RAY PEREZ** was born in 1958 and moved to the United States at the age of fourteen. He graduated with a B.S. degree in Physics in 1979 and a M.S. degree in High Energy Particle Physics in 1981, both from the University of Florida, Gainesville, Florida. Later, while looking for a more “practical” side of electromagnetic and electronics work, he quit his doctoral studies in physics and changed his profession to electrical engineering. He received his M.S. and Ph.D. degrees in electrical engineering in 1983 and 1988, respectively.

Since 1988 Ray has been working at the Jet Propulsion Laboratory of the California Institute of Technology, Pasadena, CA. Over the last six years he has been relocated by his company to work with Lockheed Martin Corporation in Denver, Colorado and Ball Aerospace on several projects. Ray’s early work in computational electromagnetics (CEM) dealt with minimizing electromagnetic interference (EMI) in spacecraft electronics, especially for interplanetary spacecraft which are exposed to very adverse space radiation environments. Over the last few years Ray has been involved more with electronic design (RF/MW and analog/digital) for Telecommunication systems. He uses CEM to “fine tune” various designs. Ray’s present business is in the area of wireless and telecommunication systems design for satellites, mobile wireless systems, and wireless networking. He is one of the lead designers of the telecommunication system of the Mars Global Surveyor (1996), Stardust (1998), Mars Surveyors Orbiter and Lander (1998—this one “crashed” on Mars), Genesis (2001), and Mars Odyssey (2001).

Ray is a member of the American Institute of Physics (AIP), the American Association of Physics Teachers (he still does some Physics!) and the American Institute of Astronautics and Aeronautics (AIAA). He serves as the IEEE Transactions Associate Editor for the EMC Journal, as Associate Editor for Book Reviews of the IEEE EMC Society Newsletter, and as the Editor-In-Chief of the ACES Newsletter. He has published papers in all of the above societies. He is a member of the National Society of Professional Engineers and a NARTE certified engineer. Ray has also served as adjunct faculty teaching Physics and Electrical Engineering.

## **PAST SERVICE TO ACES**

My first involvement with ACES was with the Newsletter since 1990 as the Associate Editor. Since 1994 I have had the pleasure to serve ACES as the Editor-In-Chief of the ACES Newsletter, and a member of the ACES Editorial Board. The ACES Newsletter, with the tremendous help of excellent Associate Editors, has tried to serve the members of ACES for many years by tailoring our feature articles to the needs of our readers.

## **CANDIDATE’S PLATFORM**

I have been involved in ACES since its early days in the 1980’s and over the last eight years I have been the ACES Newsletter Editor. In talking about the past, the ACES Newsletter has come a long way under my leadership since its early days. Over the years we have tried to make the newsletter a publication where the voice of our highly diverse members are heard, on issues concerning computational electromagnetics. Interdisciplinary discussions, papers, and tutorials have been presented over many years, and I am particularly proud of having served as a conduit for making the ACES Newsletter a diverse publication. The ACES Newsletter will soon get new leadership, but the new leaders have promised me to continue on the road of diversity: a) diversity in the people who contribute to the newsletter, and b) diversity in the articles published.

In talking about the present, I would like to help guide ACES along its interdisciplinary roots, again this is also part of the diversity theme of which I am an advocate. Computational electromagnetics (CEM) is embedded in almost all the sciences and engineering fields, and I am convinced that the future of ACES is directly tied to how well we address the diverse needs and interests of our present and future members. In this path, I became the guest editor for a new special issue of the ACES journal on the role of CEM in wireless communication, published fall 2000. I would like to contribute to the interdisciplinary nature of ACES by expanding its role into areas of biology, process and manufacturing engineering, component engineering, design engineering (including software), medicine, astronomy, education, etc.

**OTHER UNIQUE QUALIFICATIONS** Statement not supplied by candidate!

## **GENERAL BACKGROUND**

**OMAR M. RAMAHI** received the BS degrees in Mathematics and Electrical and Computer Engineering from Oregon State University, Corvallis, OR in 1984. He received his M.S. and Ph.D. in Electrical and Computer Engineering in 1986 and 1990, respectively from the University of Illinois at Urbana-Champaign. From 1990-1993, Dr. Ramahi held a visiting fellowship position at the University of Illinois at Urbana-Champaign. From 1993 to 2000, he worked at Digital Equipment Corporation (presently, Compaq Computer Corporation), where he was member of the alpha server product development group. In August of 2000, he joined the faculty of the James Clark School of Engineering at the University of Maryland at College Park, where he is also a faculty member of CALCE Electronics Products and Systems Center.

Dr. Ramahi served as a consultant to several companies. He was instrumental in developing computational techniques to solve a wide range of electromagnetic radiation problems in the fields of antennas, high-speed devices and circuits and EMI/EMC. His interests include experimental and computational EMI/EMC studies, high-speed devices and interconnects, biomedical applications of electromagnetics, novel optimization techniques, interdisciplinary studies linking electromagnetic application with new materials. He has authored and co-authored over 80 journal and conference papers and presentations. He is a co-author of the book *EMI/EMC Computational Modeling Handbook* (Kluwer Academic, 1998). Dr. Ramahi is a Senior Member of IEEE and a member of the Electromagnetics Academy.

## **PAST SERVICE TO ACES**

The candidate's past service to ACES includes presentation of papers, organization of special sessions for the ACES Symposia and participation as short course instructor.

## **CANDIDATE'S PLATFORM**

The field of electromagnetism (EM) is probably one of the very few fields in applied science that has reached a high level of maturity. Computational electromagnetics, which is considered the applied side of electromagnetism, has witnessed an explosive growth in the past fifteen years. Today, we have numerical algorithms that can characterize wave-matter electromagnetic interaction with a high degree of accuracy and with sufficient speed. Despite the maturity in both theoretical and computational electromagnetics, the application of computational EM to new technological frontiers remain in its infancy. For instance, in the emerging field of nanotechnology, electromagnetism is expected to play a significant role. For computational EM practitioners, the primary challenge is in the fact that these new technologies are driven by strong interdisciplinary research teams that are typically devoid of computational EM experts. Interestingly enough, the classical EM practitioner paradigm has changed. Instead of using computational EM to solve known problems, we need to look at applications that can be designed by harvesting the power of EM with the aid of computational EM.

Having the vantage point of working with mechanical, electrical, and aerospace engineers in the emerging technologies, I have the advantage of identifying new and significant applications of computational EM and bring these applications to the EM community through ACES.

**OTHER UNIQUE QUALIFICATIONS** Statement not supplied by candidate!