

## PREFACE

The Fifteenth Joint Workshop on Electron Cyclotron Emission (ECE) and Electron Cyclotron Heating (ECH) was held 9–13 March 2008 in the United States at the Yosemite Lodge, Yosemite National Park, California. The meeting was hosted by General Atomics and was supported by the General Atomics Energy Division and the U.S. Department of Energy, Communications and Power Industries and Calabazas Creek Research.

The workshop is a continuation of a series begun in 1979 to provide a specialized forum for discussions among experts in the reciprocal processes of emission and absorption of energy at the electron cyclotron resonance in a wide range of plasmas, but with primary concentration on controlled fusion research, where the topics have steadily grown in importance over the years. The ITER project, an international partnership of nations, which is constructing a large fusion research device based on the tokamak, will use ECH for startup, for plasma heating and for current drive and will use ECE as a major diagnostic technique. Both ECE and ECH have stood the test of time and have matured into key elements of this next big step in magnetic fusion research and many of the attendees at EC-15 are or will be working on this ambitious undertaking.

The Local Organizing Committee comprised:

John Lohr, General Atomics, chairman  
Lupe Cerda, General Atomics, conference secretary  
Anne White, UCLA, scientific secretary  
Woodie Jarrett, General Atomics, publications  
Liz Kim, General Atomics, web site  
Max Austin, University of Texas-Austin  
Mirela Cengher, General Atomics  
Yury Gorelov, General Atomics  
Ron Prater, General Atomics

The International Program Committee was responsible for the broad scope organization of the technical program. The members were:

Sante Cirant, Italy, chairman  
Bob Harvey, U.S.  
Angela Fernández-Curto, Spain  
Shin Kubo, Japan

Ron Prater, U.S.  
 Avrilios Lazaros, Greece  
 Evgeny Suvorov, Russia  
 Gary Taylor, U.S.  
 George Vyakis, ITER

There were 92 presentations from attendees representing 14 countries, which were grouped into four categories, Technology (12,18), ECRH (9,8), ECE (9,11) and Theory (11,11), where the numbers of oral and poster presentations, (o,p), for each category are indicated in parentheses. The four topical areas were summarized by Egbert Westerhof, Heinrich Laqua, John Caughman and Nikolai Marushchenko, respectively. In addition, the conference was enriched by three special invited talks by Don Melrose on electron cyclotron maser emission from space plasmas, Fritz Leuterer on the history of the ECH system on ASDEX-U and Alan Costley on the development of ECE as a mainline diagnostic tool from about the time of EC-1 to the present. These unique presentations were made in an evening session following an afternoon spent tromping through the snow among the massive sequoias, one of the signature features of Yosemite National Park.

During the course of its 30-year history, the EC series of workshops has visited many of the countries engaged in fusion research and high power millimeter microwave technology development. Here is a list of the workshop sites with the conference organizers in parentheses:

- EC-1** College Park, Maryland, USA, 1979 (D.A. Boyd)
- EC-2** Oxford, UK, 1980 (A.E. Costley and A.C. Riviere)
- EC-3** Madison, Wisconsin, USA, 1982 (D.A. Boyd)
- EC-4** Frascati, Italy, 1984 (P. Buratti and M. Bornatici)
- EC-5** San Diego, California, USA, 1985 (R. Prater and J. Lohr)
- EC-6** Oxford, UK, 1987 (A.E. Costley and A.C. Riviere)
- EC-7** Hefei, Anhui, China, 1989 (Wan Yuan Xi and A.E. Costley)
- EC-8** Gut Ising, Germany, 1992 (H.J. Hartfuss and V. Erckmann)
- EC-9** Borrego Springs, California, USA, 1995 (J. Lohr and T. Luce)
- EC-10** Ameland Island, The Netherlands, 1997 (T. Donne and T. Verhoeven)
- EC-11** Oh-arai, Japan, 1999 (T. Imai and K. Sakamoto)
- EC-12** Ain-en-Provence, France, 2002 (G. Giruzzi and M. Lennholm)
- EC-13** Nizhny Novgorod, Russia, 2004 (A.G. Litvak)
- EC-14** Santorini Island, Greece, 2006 (J.L. Vomvoridis and A. Lazaros)
- EC-15** Yosemite National Park, California, USA, 2008 (J. Lohr)

The workshop is fortunate that there were three strong candidates offering to serve as host for EC-16. After a secret ballot among the organizers and committee

members, which was won by a single vote, the offer of the Institute of Plasma Physics of the Chinese Academy of Sciences was accepted. The workshop will be held at Sanya City, Hainan, China 12–15 March 2010 under the local chairmanship of Prof. Jiangan Li. The chairman of the International Program Committee for EC-16 will be Egbert Westerhof.

From having attended the very first in this series of workshops to having served as the local chairman of the most recent, I can only marvel at the progress in our reciprocal fields, separated as they are by about 12 orders of magnitude in power. In 1979, the question was whether ECE could actually be used to infer anything useful about a thermonuclear plasma in the presence of suprathermal tails on the electron distribution function and optically grey plasmas. At the same time, short pulse gyrotrons at the absolute limits of the available technology, with unimaginable output power around 100 kW at frequencies of interest to the magnetic fusion community, were just being developed. Now, cw 170 GHz gyrotrons with output power around 1 MW are being tested for ITER to suppress the very islands being imaged by ECE. Our fields have been joined now by more than just the theory of emission and absorption. At EC-15 this progress was on display for all of us to see and to appreciate

Many thanks from me personally to the members of the Local Organizing Committee, who were responsible for handling the many details that only are noticed when they are forgotten, and to the members of the International Program Committee, who prepared the diverse program. The editor thanks Daniela Farina, Dirk Strauss and Jan Clausen, who provided additional photos for the proceedings. Thanks also to the employees of the Delaware North Company, from the bus driver who waited for us to the chefs who cooked for us to the person who turned on the water for Yosemite Falls each morning. Finally, many thanks to Laurence Juber for the absolutely delightful concert evening.



John Lohr  
San Diego, August 2008