

## Foreword

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The goal of the fourth NASA Space Electrochemical Research and Technology (SERT) Conference, like that of the previous three conferences, was to examine the present status of electrochemical research and technology applicable to aerospace missions in the next decade. NASA is also promoting dual-use technology, those technology areas which are important for commercial applications as well as for aerospace.

The SERT Conference was held at the Lewis Research Center on April 14–15, 1993. The attendees represented 44 governmental, industrial and academic organizations and laboratories.

The conference was opened by Shahid Habib of NASA Headquarters, who reviewed the past uses of batteries in aerospace applications and requirements for the future. This was followed by a talk by L. Dean Price, Special Consultant to the President of Georgetown University, which illustrated the successes and future potential of the Integrated Community Energy System at Georgetown based on fuel cell cogeneration. This will eventually include fuel cell powered transportation. Some of the components of the Integrated Community Energy System that are already in place include solar cells, water reservoirs using off-peak electric chillers to generate chilled water for use during the daytime, and a fluidized bed combustor (a high sulfur clean coal system — the first clean coal institutional system in the USA).

Twenty-eight technical papers were presented at the three technical sessions. The topics ranged from fundamental research to advanced engineering applications. The session on Advanced Rechargeable Batteries featured discussions on the state-of-the-art nickel/cadmium and nickel/hydrogen batteries, proposed lightweight electrodes for these systems, nickel/metal hydride and sodium/sulfur batteries and several types of rechargeable lithium batteries.

New ideas on lightweight substrates for batteries and fuel cells were presented at the session on Advanced Concepts, along with studies on hairy carbon electrodes, capacitors, aluminum/oxygen cells and hydrogen/chlorine fuel cells.

The Fuel Cell session included papers on mixed metal oxides as electrocatalysts, polymer electrolyte fuel cells and electrolyzers and studies on direct methanol/air fuel cells.

Overall, the conference illustrated the continuing interest in the nickel electrode and nickel battery systems and in polymer electrolyte fuel cells, systems vital to the support of both future NASA missions and advanced terrestrial applications such as military uses and electric vehicles. The diversity and quality of the other papers are an encouraging indication of the inventiveness and vitality of the electrochemical community.

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