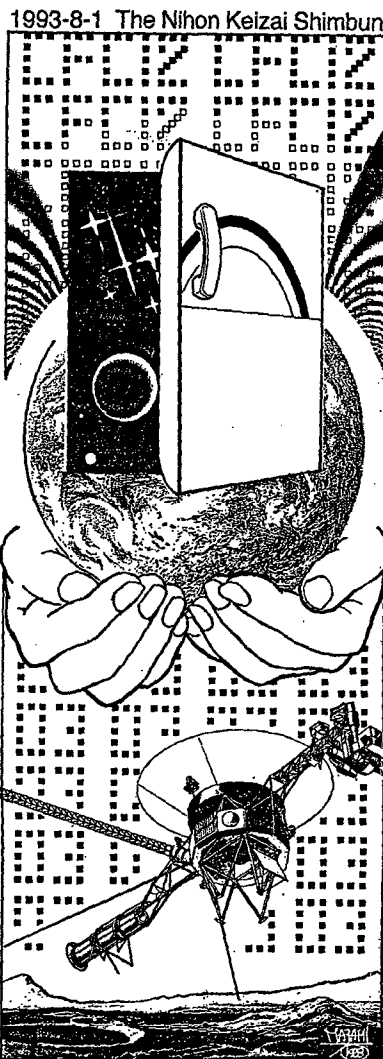


The International Thermoelectric Society

**SCT- 93**

**SHORT COURSE ON THERMOELECTRICS**



Illustrate by Masami Ishii

*FOR THE GREEN  
21st CENTURY*

**Pacific Convention Plaza Yokohama  
Japan**

**8th November 1993**

Sponsored by the International Thermoelectric Society

Organized by ITS Japan Branch

Edited by: The International Thermoelectric Society

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**Short Course on Thermoelectrics - 1993 (SCT-93)**

Organized by : The International Thermoelectric Society (ITS)

ITS Japan Branch

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# 1993 SHORT COURSE ON THERMOELECTRICS

## SCT-93

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## **PREFACE**

The Short Course on Thermoelectrics (SCT-93) is not a novel idea, but one that was borrowed from Dr. K. R. Rao. Between 1970 to 1975 Dr. Rao organized the "Annual Short Course on Thermoelectric Devices and their Applications" at the University of Texas at Arlington and invited many distinguished lecturers from all over the world. This Course paved the way for the first "International Conference on Thermoelectric Energy Conversion (ICTEC)" which was held in 1976 and every two years thereafter until 1988.

In March 1988 the International Thermoelectric Society (ITS) was established in the spirit of serving the best interests of both researchers and industry. And the ICTEC grew to become the "International Conference on Thermoelectrics (ICT)" which has been meeting every year since 1988.

At the XI ICT'92 in Arlington Tex., it was suggested that a "Short Course on Thermoelectrics" such as those in the early seventies in Arlington should be given before ICT Conferences for the people who want to get knowledgeable about thermoelectrics. The ICT attendees will include management personnel, students, customers, salespeople, scientists and engineers who work in very specific areas of thermoelectric technology, many of whom are not familiar with topics outside their specialty. For these people we feel the Short Course on Thermoelectrics is a prerequisite in order to fully assimilate the ensuing 3-day ICT Conference.

It now appears appropriate to start up, once again, and it is very appropriate that such a course will be associated with the XII ICT in Yokohama, as an ITS activity.

I would like to express my thanks to all the lecturers for their cooperation and contributions to the Short Course on Thermoelectrics (SCT-93) organized by ITS Japan Branch. I would also like to thank Mr. R. V. Jensen, President of Melcor, to encourage us to promote awareness of the real potential thermoelectrics having these Short Course that has to offer for both active and new applications.

I would also like to thank Ms. Masami Ishii and the Japan Economic Journal for the use of the illustration that exactly fits in with the theme of this Course. Many thanks are also due to my family.

November 1993

K. I. Uemura  
Organizer  
SCT-93

# PROGRAM

## SHORT COURSE ON THERMOELECTRICS

November 8th (Monday), 1993: Start 9:00 am

**Lecture 1: An Overview of Thermoelectrics**

9:00 am to 9:30 am (30 min)

**David D. Allred**

Brigham Young University, UT, USA

**Lecture 2: Thermoelectric Fundamentals and Physical Phenomena**

9:30 am to 10:15 am (45 min)

**Cronin B. Vining**

Jet Propulsion Laboratory/California Institute of Technology, CA, USA

Questions 15 min (10:15 am to 10:30 am)

Coffee Break 15 min (10:30 am to 10:45 am)

**Lecture 3: Evaluation & Selection of Materials for TE Applications**

10:45 am to 11:30 am (45 min)

**Jean-Pierre Fleurial**

Jet Propulsion Laboratory/California Institute of Technology, CA, USA

**Lecture 4: Basic Consideration in the Selection of TE Technology**

11:30 am to 12:10 am (40 min)

**B. Mathiprakasam**

Midwest Research Institute, MO, USA

Questions 12:10 pm to 12:25 pm (15 min)

Lunch 12:25 pm to 1:25 pm (60 min)

**Lecture 5: Thermoelectric Modules for Power Generation & Cooling**

1:25 pm to 1:55 pm (30 min)

**K. I. Uemura**

Institute for Thermoelectric Technologies Japan, Yokohama, Japan

**Lecture 6: Characterization of TE Materials & Devices**

1:55 pm to 2:40 pm (45 min)

**Richard. J. Buist**

TE Technology, Inc., MI, USA

Questions 2:40 pm to 2:55 pm (15 min)

Break 2:55 pm to 3:10 pm (15 min)

**Lecture 7: How to use thermoelectrics? Thermoelectric systems, dimensioning, design and technology**

3:10 pm to 4:10 pm (60 min)

**John G. Stockholm**

Marvel S. A. Vernouillet, France

Questions 4:10 pm to 4:25 pm (15 min)

Coffee Break 4:25 pm to 4:40 pm (15 min)

**Lecture 8: Laboratory, Industrial, and Consumer Applications**

i) **Laboratory** 4:55 pm to 5:10 pm (15 min)

**K. I. Uemura**

ii) **Industrial** 4:40 pm to 4:55 pm (15 min)

**John G. Stockholm**

iii) **Consumer** 5:10 pm to 5:25 pm (15 min)

**Richard J. Buist**

Questions 5:25 pm to 5:40 pm (15 min)