

CHARLES F. KUTSCHER

CAPABILITIES *Computer modeling of thermal, fluids, mass transfer, and optical problems; experimental design and instrumentation; program and project management; public speaking and teaching; technical writing*

EXPERIENCE **Principal Engineer, Team Leader** **November 1978 - Present**
National Renewable Energy Laboratory, Golden, Colorado

- ! Lead NREL Geothermal Energy Team. Duties include directing and conducting in-house research and supporting the Department of Energy in program management. Invented and developed a promising a new air-cooled condenser concept.
- ! Developed fundamental fluid dynamics and heat transfer theory for a new type of solar collector (the transpired collector); built a wind tunnel and solar simulator and wrote solar simulator computer model.
- ! Led team that developed high-concentration stretched membrane parabolic dish; wrote optical analysis program and performed finite element structural analysis.
- ! Principal investigator on liquid desiccant dehumidification project for U.S. Navy; wrote computer models of absorption and distillation columns.
- ! Led team that produced design handbook for solar industrial process heat systems; prime author of SOLIPH, the comprehensive computer model of solar industrial process heat systems.
- ! Designed, instrumented, and operated NREL's Desiccant Cooling Test Loop.

Engineer (Member of Technical Staff III) **May 1975 - November 1978**
Energy Technology Engineering Center, Rockwell International, Canoga Park, California

- ! Wrote computer cost optimization model of heat exchangers for Barstow Solar Central Receiver Project.
- ! Performed thermal/hydraulic analysis of liquid sodium piping loops and components.
- ! Performed stress analysis of piping loops.

Assistant Engineer **October 1972 - August 1973**
Sperry Rand Corporation, Great Neck, New York

- ! Wrote high-level and assembly language programs for U.S. Navy's Mark 92 Fire Control System.

- OTHER CONTRIBUTIONS**
- ! Adjunct professor; have taught undergraduate and graduate heat transfer courses at Colorado School of Mines and University of Colorado at Boulder.
 - ! Served as Unit Scientist of *Solar Energy* unit for National Geographic Society's Kids Network.
 - ! Co-winner of 1994 *R&D 100 Award*, *Popular Science* "Best of What's New" award, Federal Laboratory Consortium Award of Merit, and NREL Technology Transfer Award for transpired solar collector development.
 - ! Developed a two-hour tutorial on experimental design. Have presented at the 1996 ASME International Solar Energy Conference and the University of Colorado.
 - ! 1996-1997 Associated Western Universities Distinguished Lecturer.
 - ! Regular speaker in Solar in Federal Buildings Program Design Workshops.

- EDUCATION**
- Ph.D., Mechanical Engineering, GPA 4.0/4.0** **December 1992**
 University of Colorado, Boulder, Colorado
 (obtained degree while working at NREL)
 ! Concentration Areas: *Fluid Dynamics, Heat Transfer*
 ! THESIS: *An Investigation of Heat Transfer for Air Flow through Low-Porosity Perforated Plates*
- M.S., Nuclear Engineering, GPA 3.8/4.0** **May 1975**
 University of Illinois, Champaign-Urbana, Illinois
 ! Concentration Areas: *Heat Transfer, Reactor Safety*
- B.S., Physics, Magna Cum Laude, GPA 3.5/4.0** **May 1972**
 State University of New York at Albany, Albany, New York

- PROFESSIONAL ACTIVITIES**
- ! Registered Professional Engineer (by examination) in Colorado and California.
 - ! Chairman of the American Solar Energy Society (2000-2001); serve on *Solar Today* Magazine Management Board.
 - ! Member of University of Colorado Department of Mechanical Engineering Industry Advisory Committee
 - ! Was U.S. Representative for International Energy Agency Solar Heating and Cooling Program Task 14, "Advanced Active Solar Energy Systems."

PUBLICATIONS Over 30 research reports and papers and chapters in four technical books.

COMPUTER FORTRAN, Visual Basic, FLUENT, Algor, ASPEN, SigmaPlot, Design-Ease.

SKILLS