

REPORT DOCUMENTATION PAGE

Form Approved
OMB NO. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comment regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE June 28, 1996	3. REPORT TYPE AND DATES COVERED Final 15 May 95 - 14 May 96	
4. TITLE AND SUBTITLE Ninth International Conference on Hot Carriers in Semiconductors			5. FUNDING NUMBERS DAAH04-95-1-0349	
6. AUTHOR(S) Karl Hess, Jean-Pierre Leburton and Umberto Ravaioli				
7. PERFORMING ORGANIZATION NAMES(S) AND ADDRESS(ES) Beckman Institute and Coordinated Science Laboratory University of Illinois at Urbana-Champaign 405 North Mathews Avenue Urbana, IL 61801			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Research Office P.O. Box 12211 Research Triangle Park, NC 27709-2211			10. SPONSORING / MONITORING AGENCY REPORT NUMBER ARO 34116.1-EL-CF	
11. SUPPLEMENTARY NOTES The views, opinions and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other documentation.				
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution unlimited.			12 b. DISTRIBUTION CODE 19960909 087	
13. ABSTRACT (Maximum 200 words) The <i>Ninth International Conference on Hot Carriers in Semiconductors</i> (HCIS-9) was held July 31 - August 4, 1995 in Chicago, Illinois. It drew an international contingent of 170 scientist from 19 countries including the USA, the United Kingdom, Germany, Japan, the former Soviet Union, Italy and Austria. The research discussed at this conference advanced the state of the art in many areas, and it is expected to open new horizons in nonlinear transport studies, particularly in the areas of hot-electron and quantum transport. An attempt was made by the program committee to increase the number of presentations related directly to devices for this HCIS conference. Such works produced a rich discussion on a variety of transport effects.				
14. SUBJECT TERMS hot carriers, femtosecond spectroscopy, Bloch oscillations, nanostructures, low-dimensional systems, quantum transport, high field transport, impact ionization, quantum well lasers.			15. NUMBER OF PAGES	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OR REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UL	

Hot Carriers in Semiconductors

Edited by

Karl Hess

Jean-Pierre Leburton

and

Umberto Ravaioli

*University of Illinois at Urbana—Champaign
Urbana, Illinois*

Plenum Press • New York and London

**NINTH INTERNATIONAL CONFERENCE ON
HOT CARRIERS IN SEMICONDUCTORS**

KARL HESS, JEAN-PIERRE LEBURTON AND UMBERTO RAVAIOLI

JUNE 28, 1996

U.S. ARMY RESEARCH OFFICE

GRANT NUMBER: DAAH04-95-1-0349

**BECKMAN INSTITUTE AND COORDINATED SCIENCE LABORATORY
UNIVERSITY OF ILLINOIS AT URBANA CHAMPAIGN, 61801**

**APPROVED FOR PUBLIC RELEASE;
DISTRIBUTION UNLIMITED.**

**THE VIEWS, OPINIONS AND/OR FINDINGS CONTAINED IN THIS REPORT ARE
THOSE OF THE AUTHORS AND SHOULD NOT BE CONSTRUED AS AN OFFICIAL
DEPARTMENT OF THE ARMY POSITION, POLICY OR DECISION, UNLESS SO DES-
IGNATED BY OTHER DOCUMENTATION.**

The *Ninth International Conference on Hot Carriers in Semiconductors* (HCIS-9) was held July 31 – August 4, 1995 in Chicago, Illinois. It drew an international contingent of 170 scientist from 19 countries including the USA, the United Kingdom, Germany, Japan, the former Soviet Union, Italy and Austria. The research discussed at this conference advanced the state of the art in many areas, and it is expected to open new horizons in nonlinear transport studies, particularly in the areas of hot-electrons and quantum transport.

Contributions to early HCIS conferences concentrated mainly on the basic physics of hot electron and hole transport in bulk semiconductors, mostly Ge, Si and GaAs. At later HCIS conferences, progress in the fabrication of new forms of semiconductor heterostructures grown by MBE and other techniques spawned contributions on transport effects in small and ultrasmall semiconductor structures such as tunneling, resonant tunneling, ballistic transport, and low-dimensional transport at later HCIS conferences. Advances in fabrication and theory were accompanied by experimental investigations using ever advancing techniques, such as femtosecond spectroscopy.

HCIS-9 continued the advancement of the state of art in many areas. Presentations addressed the latest issues in non-linear transport and fast electron dynamics in semiconductor materials and devices, and included both theoretical and experimental works. In addition, an attempt was made by the program committee to increase the number of presentations related directly to devices for this HCIS conference. Such works produced a rich discussion on a variety of transport effects. For example, one invited presentation on the the new quantum cascade laser by Federico Capasso (AT&T Bell Labs) alone raised issues of hot electron

effects, size quantization, and intersubband scattering. In our opinion, such results suggests that future conferences should further encourage reports on such device research.

In all there were 15 invited oral presentations, 60 contributed oral presentations and 105 poster presentations. The major areas addressed were hot carrier luminescence and femtosecond spectroscopy including measurement of carrier-phonon interactions in low-dimensional systems, Bloch oscillations and fast coherent processes in semiconductors including negative differential conductance in superlattices, hot carriers in nanostructures and low-dimensional systems including quantum transport and energy relaxation processes, high field transport and impact ionization including propagation of high-field domains and current instabilities, and hot electrons in devices including transport in quantum well lasers.

The conference proceedings are currently being prepared by Plenum Publishing Corporation. A copy will be sent as soon as available.