

AD-A110 804

CORNELL UNIV ITHACA NY SCHOOL OF ELECTRICAL ENGINEERING F/S 20/12
U.S. FRANCE WORKSHOP ON GAAS MICROSTRUCTURES AND HIGH PERFORMAN—ETC(U)
JAN 82 L F EASTMAN N00014-81-6-0074

UNCLASSIFIED

ML

1 of 1
AD
2 10/82



END
DATE
FILMED
8-82
NTIC

LEVEL

12

FINAL TECHNICAL REPORT

ON

U.S. FRANCE WORKSHOP ON GaAs MICROSTRUCTURES
AND HIGH PERFORMANCE DEVICES

HELD

JUNE 8-10, 1981

AT

COPLEY PLAZA HOTEL

BOSTON, MASS

AD A110884

DTIC
FEB 12 1982
H

Report Prepared by

L. F. Eastman
School of Electrical Engineering
Cornell University
Ithaca, NY 14853

DTIC FILE COPY

DISTRIBUTION STATEMENT A
Approved for public release
Distribution unlimited

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER 243-038-F	2. GOVT ACCESSION NO. AD-A110 884	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) US/France Workshop on GaAs Microstructures and High Performance Devices		5. TYPE OF REPORT & PERIOD COVERED Final
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) L. F. Eastman, et al.		8. CONTRACT OR GRANT NUMBER(s) N00014-81-G-0074
9. PERFORMING ORGANIZATION NAME AND ADDRESS Cornell University School of Electrical Engineering Phillips Hall, Ithaca, NY 14850		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS PE61153N RR-021-02-03
11. CONTROLLING OFFICE NAME AND ADDRESS ONR - 414 Arlington, VA 22217		12. REPORT DATE January 1982
		13. NUMBER OF PAGES 8
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) N/A		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report) N/A		
18. SUPPLEMENTARY NOTES ONR Scientific Officer: Tel (202)696-4218		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Gallium Arsenide monolithic integrated circuits		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The U. S./France Workshop on Gallium Arsenide Microstructures and High Performance Devices, held June 8-10, 1981 in Boston, is discussed and the titles of scheduled papers and authors are presented.		

DD FORM 1 JAN 73 1473

EDITION OF 1 NOV 65 IS OBSOLETE
S/N 0102-LF-014-6601

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

**U.S. FRANCE WORKSHOP ON GaAs MICROSTRUCTURES
AND HIGH PERFORMANCE DEVICES**

This meeting is the return meeting, following one in Paris in November 1979. U.S. attendees to the first meeting were supported by the National Science Foundation, while the Office of Naval Research supported the present meeting.

At this meeting, all key technical attendees were scheduled to present talks. The attached program covers the titles of the technical presentation, along with the names of the people presenting the talks. As with the previous meeting, a mix of U.S. and French presentations was attempted on each broad topic.

The discussions after each paper, during luncheons together, and in panel sessions were lively. Both sides shared ideas and problems in a mutually beneficial manner.

In the opinion of the author, France is fast becoming "the Japan of Europe" in the area of microelectronics applied research. This meeting and other interactions in these fields are therefore very valuable.

In order to minimize expense to ONR, industrial attendees from the U.S. were asked to support themselves. A surplus of funds resulted and will be returned to ONR.

Accession For	
NTIS GPO	☒
DTIC TAB	☐
Unannounced	☐
Justification	
By	
Distribution	
Availability	
Date	
A	

**U.S. - FRANCE WORKSHOP ON GaAs MICROSTRUCTURES
AND HIGH PERFORMANCE DEVICES PROGRAM**

OVAL ROOM
Copley Plaza Hotel
Boston, Mass

Co-Chairmen
L.F. Eastman, Cornell University
M. Yoder, ONR

J. L. Teszner, DRET
E. Constant, CHS, Lille

JUNE 8-10, 1981

MONDAY MORNING, JUNE 8 - BULK AND EPI GROWTH, M. Yoder, Chairman

- 9:00 - 9:20 R. Linares, Microwave Associates
GROWTH AND PROPERTIES OF LEC GROWN SEMI-INSULATING GaAs
- 9:20 - 9:40 G. Martin, LEP
OXYGEN RELATED GETTERING OF Si DURING GROWTH OF BULK
GaAs CRYSTALS
- 9:40 - 10:00 J. P. Duchemin, Thomson CSF
STATE OF THE ART OF MOCVD FOR GaAs AND GaInAs MATERIALS
- 10:00 - 10:20 R. Calawa, Lincoln Lab
THE USE OF AsH_3 IN THE MBE GROWTH OF GaAs
- 10:20 - 10:50 BREAK
- 10:50 - 11:10 A. Munoz, LAAS
CRYSTALLOGRAPHIC DEFECTS IN GaAs GROWN BY MBE
- 11:10 - 11:30 C. Wood, Cornell University
MBE-GROWN III-V ALLOYS FOR MICROWAVE AND OPTICAL
DEVICE APPLICATIONS
- 11:30 - 11:50 R. Pucell, Raytheon
MONOLITHIC GaAs MICROWAVE INTEGRATED CIRCUITS
- 11:50 - 12:15 DISCUSSION
- 12:15 - 2:00 LUNCH

**MONDAY AFTERNOON, JUNE 8 - SESSION I - BULK AND EPI ASSESSMENT,
J. Zylberstejn, Chairman**

- 2:00 - 2:20 P. N. Favennec, CNET
IMPURITIES REDISTRIBUTION IN III-V COMPOUNDS

- 2:20 - 2:40 S. Makram-Ebeid, LEP
EXODIFFUSION PROPERTIES OF DEFECTS IN BULK GaAs
- 2:40 - 3:00 C. Evans, Evans Associates
COMPOUND SEMICONDUCTOR BULK AND EPITAXIAL MATERIAL
ASSESSMENT
- 3:00 - 3:20 D. Hobgood, Westinghouse Research
GROWTH AND CHARACTERIZATION OF LARGE DIAMETER UNDOPE
SEMI-INSULATING GaAs FOR DIRECT ION IMPLANTED FET
TECHNOLOGY
- 3:20 - 3:50 BREAK
- 3:50 - 4:10 R. H. Wallis, Thomson CSF
MOBILITY PROFILING IN SHORT-GATE MESFET's BY
MAGNETO-TRANSCONDUCTANCE MEASUREMENTS

MONDAY AFTERNOON, JUNE 8 - SESSION II - SHORT OPTICAL PULSE MEASUREMENTS
OF ELECTRON DYNAMICS, J. Ballantyne, Chairman

- 4:10 - 4:30 C. Shank, Bell Laboratory
PICOSECOND DYNAMICS OF HIGHLY EXCITED GaAs AND MULTI-
QUANTUM WELL STRUCTURES
- 4:30 - 4:50 R. L. Fork, Bell Laboratory
PICOSECOND NONEQUILIBRIUM TRANSPORT IN GaAs

MONDAY EVENING, JUNE 8 PANEL SESSION, 8:30 PM - MATERIALS FOR HIGH
SPEED/HIGH FREQUENCY DEVICES

H. Gatos, Chairman, M. Yoder, J. P. Duchemin, J. Zylberstejn

TUESDAY MORNING, JUNE 9 - SUBMICRON TECHNOLOGY AND MEASUREMENTS,
J. L. Teszner, Chairman

- 8:30 - 8:50 C. L. Anderson, Hughes Research
FOCUSED ION BEAM FABRICATION OF CHANNEL REGIONS FOR
GaAs FET's OR BIPOLARS
- 8:50 - 9:10 B. Fay, Thomson CSF
X-RAY REPLICATOR FOR SUBMICRON LITHOGRAPHY:
PRELIMINARY RESULTS
- 9:10 - 9:30 H. Rupprecht, IBM
SOME NEW ASPECTS OF GaAs MESFET TECHNOLOGY
- 9:30 - 9:50 M. Laugier, INSA LYON
OPTIMISATION OF PULSED ANNEALING TECHNIQUES FOR
GaAs I.C.'s
- 9:50 - 10:20 BREAK

10:20 - 10:40 J. Perrocheau, Thomson CSF
THERMAL LASER AND ELECTRON BEAM ANNEALING OF IMPLANTED
GaAs: PRELIMINARY RESULTS

10:40 - 11:00 J. Zylberstejn, Thomson CSF
SUBNANOSECOND D.L.T.S. STUDIES OF DEEP LEVELS IN GaAs
MESFET'S

11:00 - 11:20 R. Castagne, IEF - ORSAY
OVERSHOOT PHENOMENA IN SUBMICRON STRUCTURES

11:20 - 11:40 M. Voos, GPS - ENS
OPTICAL PROPERTIES OF SEMICONDUCTOR SUPERLATTICES

11:40 - 12:15 DISCUSSION

12:15 - 2:00 LUNCH

TUESDAY AFTERNOON, JUNE 9 - HIGH SPEED/FREQUENCY DEVICES AND IC's,
A. Murphy, Chairman

2:00 - 2:20 D. Boccon-Gibeaud, LEP
DIVIDER BY 8

2:20 - 2:40 G. Nuzillat, Thomson CSF
LOW POWER GaAs TECHNOLOGIES FOR DIGITAL IC's
OPERATING IN THE 1-2 GB/S RANGE

2:40 - 3:00 R. Lee, Hughes Research
MATERIALS REQUIREMENTS FOR GaAs HIGH SPEED CIRCUITS

3:00 - 3:20 D. Maignant, LEP
WIDE BAND 6-12 GHz POWER AMPLIFIER

3:20 - 3:50 BREAK

3:50 - 4:10 P. Jay, Thomson CSF
CHARACTERISATION TECHNIQUES APPLIED TO GaAs MMIC
PROCESSING

4:10 - 4:30 S. Bandy, Varian
GATE RESISTANCE PROBLEMS FOR SUB-HALF-MICRON DEVICES

4:30 - 4:50 R. Mattauch, University of Virginia
ADVANCES IN MILLIMETER WAVE RECEIVER ELEMENTS

4:50 - 5:10 G. Rey, LAAS
GaAlAs/GaAs MICROWAVE POWER BIPOLAR TRANSISTORS

TUESDAY, JUNE 9 - EVENING PANEL SESSION, 8:30 PM - PROCESSING AND DESIGN
OF HIGH SPEED/HIGH FREQUENCY DEVICES, L. Eastman,
Chairman, H. Dietrich, E. Constant, G. Nuzillat

WEDNESDAY MORNING, JUNE 10 - OPTICAL DEVICES, E. Constant, Chairman

8:30 - 8:50 F. Leonberger, Lincoln Lab
HIGH SPEED InP OPTOELECTRONIC SWITCHES FOR SIGNAL
PROCESSING APPLICATIONS

8:50 - 9:10 J. Ballantyne, Cornell University
PHOTOCONDUCTIVE AND PLANAR-DOPED BARRIER OPTICAL
DETECTORS IN III-V COMPOUNDS

9:10 - 9:30 A. Scavennec, CNET
LOW-CURRENT HETEROJUNCTION TRANSISTOR FOR
INTEGRATION AND PHOTODECTION

9:30 - 9:50 H. Taylor, NRL
POSSIBLE APPLICATIONS FOR HIGH-SPEED OPTOELECTRONIC
DEVICES

9:50 - 10:10 BREAK

10:10 - 10:30 C. Fonstad, MIT
MATERIALS TECHNOLOGY FOR HIGH SPEED HETEROSTRUCTURE
DEVICES

10:30 - 10:50 P. Devoldere, CNET
A NEW STRIPE STRUCTURE FOR 1.3 MICROMETER LASER AND
EDGE EMITTING LED

PANEL SESSION - OPTICAL DEVICES

10:50 - 11:30 H. Kressel, Chairman, J. Ballantyne

11:30 - 1:20 LUNCH

WEDNESDAY AFTERNOON, JUNE 10 - SUBMICRON DEVICES PHENOMENA, L. Eastman,
Chairman

1:20 - 1:40 E. Constant, CHS Lille
ABOUT PARTICULAR FEATURES OF SUBMICRON POWER FET

1:40 - 2:00 G. Salmer, CHS Lille
VOLTAGE LIMITATIONS OF SUBMICRON FET's

2:00 - 2:20 M. Shur, University of Minnesota
ELECTRON TRANSPORT IN SMALL SEMICONDUCTOR DEVICES

2:20 - 2:40 R. Malik, Cornell University and ERADCOM
GaAs PLANAR DOPED BARRIER DIODES AND TRANSISTORS
GROWN BY MBE

2:40 - 3:00 BREAK

3:00 - 3:20 N. T. Linh, Thomson CSF
III-V COMPOUND MICROSTRUCTURES: TWO-DIMENSIONAL
ELECTRON GAS FET - QUANTUM MECHANICAL TUNNELING

3:20 - 3:40 W. Frensley, Texas Instruments
PROSPECTS FOR A HIGH-SPEED HIGH-DENSITY GaAs BIPOLAR
TECHNOLOGY

3:40 - 4:00 C. Bozler, Lincoln Laboratory
RECENT EXPERIMENTAL RESULTS ON THE PERMEABLE BASE
TRANSISTOR

4:00 PM CLOSE WORKSHOP

DISTRIBUTION LIST

R. Linares
Microwave Associates

C. Wood
Cornell University

C. Evans
Evans Associates

C. Shank
Bell Labs

C.L. Anderson
Hughes Research

R. Lee
Hughes Research

R. Mattauch
University of Virginia

J. Ballantyne
Cornell University

C. Fonstad
MIT

W. Frensley
Texas Instruments

M. Yoder
ONR

M. Shur
University of Minnesota

H. Kressel
RCA Labs

R. Calawa
Lincoln Labs

R. Pucell
Raytheon

D. Hobgood
Westinghouse Research

R.L. Fork
Bell Labs

H. Rupprecht
IBM

S. Bandy
Varian

F. Leonberger
Lincoln Labs

H. Taylor
NRL

L.F. Eastman
Cornell University

C. Bozler
Lincoln Labs

A. Murphy
Lincoln Labs

T.N. Jackson
IBM

FILMED
3-8