LEVEL

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

Report Prepared by

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US/France Workshop on GaAs Microstructures and High Performance Devices

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Gallium Arsenide
monolithic
integrated circuits

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.
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.
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 AsH3 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 UNDOPED 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-Gibaud, 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. Meignant, 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, 3:30 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 PHOTODETECTION

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

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
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