U. Dibben, Philips, Hamburg

7. Leading Institutes

It is the aim of this chapter, to give an indication of institutes and companies active in micromechanics. The data given (if available) are:

- the institution
- the name of relevant people (former co-workers in brackets
- field of experience.

The order is at first a geographic one, starting with Germany and going on with Europe, grouped into countries. For each country the noncommercial institutes are listed before industrial companies, each of them in alphabetic order. There are only minute activities in countries of the eastern block with one exception (although not in the list): Peoples Republic of China.

7.1 Germany

Fachhochschule Furtwangen
A. Stoffel, R. Huster
Special etch techniques

Forschungsinstitut der Forschungsgesellschaft für Feingeräte-, Mikro- und Uhrentechnik e. V. (FFMU)
S. Büttgenbach
Quartz micromechanics

Fraunhofer-Institut für Mikrostrukturtechnik, Berlin
A. Heuberger, W. Benecke, U. Schnakenberg, W. Riethmüller, (L. Csepregi), (H. Seidel)
Silicon anisotropic etching; sensors for pressure, acceleration, vibration; actuators applying differential thermal expansion

Fraunhofer-Institut für Festkörpertechnologie, München
I. Ruge, H. Sandmaier, K. Kühl, P. Kopystynski, (L. Csepregi), (H. Seidel), (E. Obermeier)
Silicon anisotropic etching; pressure sensors

Institut für Mikroelektronik, Stuttgart
B. Höfflinger, H.-G. Graf
Wafer-Bonding

Kernforschungsanlage Karlsruhe
Institut für Mikrostrukturtechnik
W. Menz, (W. Ehrfeld), (D. Schmidt), (U. Ehrfeld)
LIGA-technique

Technische Hochschule Darmstadt
Institut für Übertragungstechnik und Elektroakustik
G. Sessler, D. Hohm, G. Heß, J. Franz
Piezoelectric microphone (AlN, Si, anisotr.)

Technische Universität Berlin, Fachbereich Elektrotechnik, 'Technologien der Mikroperipherik'
H. Reichl, E. Obermeier
Silicon anisotropic etching; sensors for pressure and acceleration

Battelle-Institut e. V., Frankfurt
G. Tschulena, R. Dornhaus

Bosch
Keller, G. Fiedler
Acceleration sensors

IBM Deutschland
Kulke

Messerschmitt-Bölkow-Blohm GmbH, Zentralbereich Technik
M. Kroy, H. Seidel
Acceleration sensor; integrated optics

Siemens A. G.
G. Ehrler, J. Binder
Pressure sensors

Steag AG, Bereich Mikrotechnik
W. Ehrfeld, U. Ehrfeld, D. Schmidt, D. Münchmeyer
LIGA-technique

7.2 Other Europe

Delft University of Technology, Electrical Engineering Department
S. Middelhoek, A. F. P. van der Putten, A. W. Herwaarden, P. M. Sarro
Thermal isolation; vacuum sensor

Twente University of Technology

P. Bergveld, A. J. Sprenkels, J. A. Voorthuyzen, J. H. J. Fluitman, H. T. G. van Lintel, F. C. M. van de Pol

Electret microphone, chemical sensors, ISFET; Micro pump with pneumatic actuation; piezoelectric layers

Katholieke Universiteit Leuven, Dept. of Elektrotechniek, ESAT

B. Puers, W. M. C. Sansen

Acceleration sensor; piezojunction effect

Centre Suisse d'Electronique et de Microtechnique S. A. (CSEM)

F. Rudolf, A. Jornod, A. Grisel, V. Demarne

Sensors for acceleration, pressure, gases; optical display

University of Neuchatel, Institute of Microtechnology

N. de Rooij, Ph. Racine, H. van den Vlekkert

Sensors for pressure, resonance-sensors, ISFET; electrostatic valves and motors

CEA-IRDI, Div. LETI-DOPT, Ceng 85X, 38041 Grenoble

G. Delapierre, J. S. Danel, F. Michel

Anisotropic etching of silicon and quartz; acceleration sensors; general micromechanics

Crouzet SA - Division "Aérospatial"

Acceleration sensor, monolithic (in cooperation with CSEM)

University of Birmingham, Department of Metallurgy and Materials

J. N. Shepherd, P. S. Dobson

Optical switches in <110>-Si, anisotropically etched

University of Southampton, Dep. of Electronics & Computer Science

M. B. Othman

Resonance sensors, thermally excited

Harwell Laboratory, Microelectronics Materials Centre

Micromachined sensors, Spec. materials (SiC, diamond, II-VI, II-V)

Chalmers University of Technology, Dep. of Solid State Electr.

G. Stemme, G. Kittilsland

Particle filters

7.3 United States

Carnegie-Mellon University, Dept. of Electrical and Computer Engineering
(R. T. Howe)
Poly-silicon technology

Massachusetts Institute of Technology, Microsystems Technology Laboratories
S. D. Senturia, S. F. Bart, J. H. Lang, M. F. Schlecht, (R. T. Howe), R. L. Smith, S. D. Collins, (M. Mehregany)
Electrostatic motors, chemical sensors, mechanical properties

Princeton University, Department of Electrical Engineering
G. Kaminsky

Stanford University, Integrated Circuits Laboratory and Department of Electrical Engineering
J. B. Angell, M. J. Zdeblick, (P. W. Barth), (L. M. Roylance)
Micromechanics (Si, anisotropic), micro-valve (pneumatic), fluidics

University of California, Berkeley Integrated Sensor Center
R. S. Muller, P.-L. Chen, R. M. White, L.-S. Fan, Y.-C. Tai, R. M. White, S. W. Wenzel, R. T. Howe
Piezoelectric layers (ZnO), acceleration sensors; joints, springs, and moving parts (poly-Si); ultrasound-Lamb-sensor; electrostatic motors

University of Michigan, Department of Electrical Engineering and Computer Science
K. D. Wise, H. L. Chau
Anisotric etching of Si, pressure and tactile sensors, microelectrodes

University of Pennsylvania, Center for Sensor Technologies and Department of Electrical Engineering
J. N. Zemel, P. J. Hesketh

University of Utah, Center for Engineering Design
S. C. Jacobsen, K. W. Grace, J. E. Wood, R. H. Price

Wisconsin Center for Applied Microelectronics, Department of Electrical and Computer Engineering
H. Guckel, D. W. Burns
Poly-Si techniques

Lawrence Livermore National Laboratories, Electr. Eng. Department
G. Haugen, D. R. Ciarlo
Anisotric etching of Si, corner compensation

Naval Research Laboratories, Washington, DC
H. Gray, G. J. Camprisi
Field emission cathodes

Allied Signal Aerospace Company
Acceleration sensors (Si, capacitive)

AT&T Bell Laboratories, Holmdel and Murray Hill
K. J. Gabriel, W. S. N. Trimmer, J. A. Walker, M Mehregany, J. A. Walker, L. Poteat, (G. Kaminsky)
Electrostatic motors, poly-Si technique, memory metals, anisotropic etching

Honeywell Physical Sciences Center, Bloomington, Minnesota
G. B. Hocker, R. G. Johnson
Flow sensors, anemometers

IBM, Yorktown Hights and San Jose
E. Bassous, (K. E. Petersen)
Anisotric etching, switches, light deflectors; general mechanics

IC-Sensors, Sunnyvale
H. V. Allen, S. C. Terry, J. W. Knutti, J. H. Jerman, (J. Bryzek)
Sensors for pressure, acceleration, tactile; contacts; interferometer

The Foxboro Company
P. M Zavracky
Differential pressure sensor (resonance, piezoelectr.)

MTI - Microsensor Technology Inc., Fremont
S. C. Terry, S. Saadat
Gaschromatograph

Novasensor, Fremont
J. Bryzek, J. R. Mallon jr., K. Petersen, P. Barth
Sensors for pressure and acceleration; silicon-fusion-bonding

Rosemount Inc., Eden Prairie
T. A. Knecht
Pressure sensors

Sensym,, Sunnyvale
D. Dauenhaer
Acceleration sensors

Transensory Devices, Inc., Fremont
S. C. Terry, J. W. Knutti, H. V. Allen, (K. E. Petersen)
Sensors for flow and force

7.4 Japan

Sophia University, Department of Physics
K. Uchino
Elektrostrictive Actuators

Tohoku University, Aoba Aramaki, Sendai
M. Esashi, S. Eoh, S. Shoji, T. Matsuo
Micro valves and pumps; IC-probe

University of Tokyo, Institut of Industrial Science
H. Fujita, A. Omodaka
Electrostatic linear motors

Hitachi Ltd., Central Research Labaratory
Y. Kawamura, S. Tanaka
Micromechanics (Si, anisotropic) vibrating vacuumsensor

Matsushita Electric Industrial Co. Ltd., Central Research Laboratory
T. Fukada, Y. Ise
Piezoelectric acceleration sensor; macro piezoelectric ultrasound-motor and positioner

Nissan
Acceleration sensor, Si-micromechanics, piezoresistive

Toshiba Research and Development Center
C. Tanuma, T. Ono, O. Yoshida

Toyota Central Research and Development Labs., Inc.
I. Igarashi, O. Tabata, H. Inagaki
Sensors for pressure, flow, and vibration; electronics, mechanical properties

Yokogawa Electric Corp., Corporate R&D Department 3
K. Ikeda, T Kobayashi, T, Yoshida, T. Ueda
Resonance sensors, anisotropic etching of Si and quartz