Contents:

Final Agenda v14

Speaker Profiles

Hotel and Travel Recommendations
The Eleventh Microfluidics Consortium brings together current and future stakeholders from across a wide range of backgrounds with a shared interest in facilitating the growth of the industry through better understanding of the challenges, opportunities and choices which it faces.

Our current membership includes: AMF (CH); BD-Biologics (USA); Idex (USA); Cryopak (USA); Danaher (USA); Philips (NL); Micronit (NL); Dolomite (UK); EV Group (A), Fluigent (F); Idex (USA/D); IPGG (F), Heidenhain/IMT (CH); Lonza Biologics (CH); Microcaps (CH); Micronit (NL); National Research Council of Canada (CAN); Posalux (CH); Sartorius / Stetim (USA/UK); Susos (CH), University of Cambridge (UK); Web Industries (USA); z-microsystems (A).

We organize closed meetings for our members on both sides of the Atlantic where we seek to promote our mission “to grow the market for microfluidics enabled products and services” by

- Finding shared interest across the landscape of applications
- Championing modularity and standards where appropriate
- Engaging with key industry influencers

While doing a few deals along the way.

On this occasion our closed session on January 30th is hosted by the Lydia Sohn Laboratory of the University of California in Berkeley. It has been organized to fit in just after SLAS in San Diego which is a ‘must go’ event for several of our members and just before Photonics West.

The University of California was chartered in 1868 and its flagship campus — envisioned as a "City of Learning" — was established at Berkeley, on San Francisco Bay. Today the world's premier public university and a wellspring of innovation, UC Berkeley occupies a 1,232 acre campus with a sylvan 178-acre central core. From this home its academic community makes key contributions to the economic and social well-being of the Bay Area, California, the nation, and the world.
Jan 30th Day Programme – Hosted by the Lydia Sohn at University of California in Berkeley. Location 3110 Etcheverry (see logistics section for maps and room details)

9:00 Registration and coffee
9:30 Introductions & House Rules – Peter Hewkin

10:00 Working Session 1: Research

Lydia Sohn – Professor of Mechanical Engineering and Bio Engineering
UC Berkeley

Lydia L. Sohn received her A.B. (Chemistry and Physics, magna cum laude 1988), A. M. (Physics, 1990), and Ph.D. (Physics, 1992) from Harvard University. She was an NSF/NATO postdoctoral fellow at Delft University of Technology (1992-1993) and a postdoctoral fellow at AT&T Bell Laboratories (1993-1995). Sohn was on the Physics faculty at Princeton University (1993-2003) prior to joining the Mechanical Engineering Dept. at UC Berkeley in 2003. In addition to being a Professor of Mechanical Engineering, Sohn is a Core Member of the UCSF-UC Berkeley Joint-Graduate Group in Bioengineering. Sohn has received numerous awards, including the NSF CAREER, Army Research Office Young Investigator Award, and the DuPont Young Faculty Award. In 2010, Sohn received the prestigious W. M. Keck Foundation Medical Research award to develop a label-free method for screening and sorting rare cells. Sohn was named a Bakar Fellow at UC Berkeley in 2013 for her innovative work in isolating and screening single CTCs from metastatic breast-cancer patients.

Dorian Liepmann – Professor of Mechanical Engineering and Bio Engineering
UC Berkeley

The Liepmann group works within the Berkeley Micro-Fluid Dynamics Laboratory which is a multidisciplinary group working on many aspects of fluid mechanics at small scales. This work spans many areas including

- Design of MEMS & Microfluidic Devices, Components/ Systems
- BioMEMS and application of MEMS to Biomedical Problems
- Fundamental studies of fluid mechanics at very small scale, and
- Integrated systems.

Graduate students in the laboratory are mainly from either the UC Berkeley - UC San Francisco Graduate Program in Bioengineering or the UC Berkeley Mechanical Engineering Department. They have a wide range of undergraduate backgrounds including Biomedical, Civil, Electrical, General, and Mechanical Engineering, as well as applied mechanics and applied physics. Undergraduate students are welcome and generally come from Bioengineering, although we have had several from Mechanical Engineering.

The laboratory is associated with BSAC (the Berkeley Sensor & Actuator Center) and all laboratory members get to become affiliated this large interdisciplinary, MEMS-based research consortium and participate in all BSAC functions.

11:00 Break / Networking
11:15 Working Session 2: What’s up? Latest news from MF11 Members

Mattias Tidare – GE Healthcare (Sweden)

Biacore Microfluidics, is celebrating 30 years. The first Biacore instrument was launched 1990, with a microfluidic system called IFC (Integrated µ fluidic cartridge). The Biacore IFC includes channels, valves and flow cells to control the fluidics and are also designed to control the temperature of the incoming liquids.

Today the IFCs has a proven reliability of around a year and are normally changed every 6 months.

The IFCs are made of injection molded plastic plates and molded silicone elastomer layers. The IFC interfaces towards tubing, needles, pneumatics and a sensor surface with chemistry are kept constant and are one reason to the success.

The adoption to new application demands have been solved with changes in channel design, positioning and number of valves and design of flow cells.

The design with injection molded plastic plates and molded silicone elastomer layers works well in production, but the time to make molds, and the number of iterations needed to fine tune the microfluidic system are time consuming. Today GE has research ongoing with rapid prototyping to find alternative ways make quick prototypes.

Marco Nadalin – Posalux SA

Posalux is a leading manufacturer of micro-technology machines intended for mass production.

From our headquarters in Biel, Switzerland, we engineer & produce world-renowned system solutions.
Our clients are distinguished companies leading the automotive, electronic, watch, and medical industries.
Thanks to our global network of Posalux branches and agents, we are able to provide reliable services and support to our customers worldwide.

Robin de Bruijn - Philips Innovation Services

Philips Innovations Services, segment MMD consists of two facilities in Eindhoven (The Netherlands)

**Micro Devices facility:** For prototyping as well as volume production. Our services are industrial PCBA prototyping, assembly of high-end PCBAs, interconnect architecture & prototyping.

**MEMS Foundry, High Tech Campus:** Our MEMS Foundry is specialized in low to medium volume custom MEMS manufacturing of 4, 6, 8 inch and even square substrates. We offer the flexibility to use substrate materials like silicon, SOI, GaAs, glass, quartz and CMOS-wafers
Sebastian Stoeckeler  z-microsystems

z-microsystems is specialist for microfluidic consumables and Lab-on-a-chip applications, from development to high volume production of micro-structured plastic parts. Micro-tooling and micro injection moulding is our passion. 60 years of experience and a fresh and dynamic team is awaiting you. We would like to be your inspiring partner from the idea to high volume production.

Luke Ghislain – Beckman Coulter

We describe a new mass spectrometry sampling technique that is a novel integration of acoustic droplet ejection technology, an open-port probe sampling interface and an electrospray ionization mass spectrometry instrument creating a transformative analytical system enabling label-free bioanalysis at high speed. This next generation platform is applied to assay for high throughput screening; label-free in-situ enzyme kinetics; pharmacokinetic & biomarker analysis and nano-scale parallel medicinal chemistry.

The acoustic droplet ejection (ADE) technology delivers nanoliter volume droplets in a touchless manner at high speed with high reproducibility, high precision and high absolute accuracy. Sample dilution within the open-port probe (OPP) sampling interface at low nanoliter sample volume enables a by-passing of the often-needed laborious sample preparation and method development steps. This technology integration removes the inherent chromatographic bottlenecks to high throughput workflows, providing tolerance for complex biological matrices such as high concentrations of proteins and salts. Analytical specificity and sensitivity of standard ESI-MS provides broad compound coverage and high sensitivity to routinely quantify the formation of nanomolar products. This innovation can operate at a rate that is faster than one second-per-sample with four orders of magnitude of linear dynamic range within a new label-free paradigm. We showcase broad applications in biological and chemical research empowering the drug discovery process.

13:00 Lunch / Networking
13:45 Working Session 3: Microfluidics Applications

Rajiv Bharadwaj VP Hardware Engineering & Microfluidics 10X Genomics

Rajiv Bharadwaj, Ph.D., is responsible for leading microfluidics programs at 10x Genomics for single cell, genomics, and exome applications. Rajiv earned his Ph.D. from Stanford University and has worked in the biotech industry for ten years with previous roles at Caliper Life Sciences.

Troy Lionberger – Technology Development Director - Berkeley Lights

I develop technologies that overcome a central problem faced by cell biologists: most of the time spent performing scientific experiments is often wasted waiting for cells to grow to a volume and density large enough to make precise measurements of cell behavior. This one issue is a theme that cuts across most areas of cell biology, and often limits the numbers of experiments that can be completed for practical reasons (e.g., not enough time, people, money, and/or capacity).

At Berkeley Lights, I am accelerating the pace of science by developing new tools that make it possible to make meaningful measurements with a million-fold fewer cells than are required by conventional technologies. My team has created a high-throughput microscopy platform (Beacon) that is capable of making high-precision measurements from only a few cells. As a result, complex experiments can now be performed between 10 and 100 times faster using a fully automated and reproducible process.

I am currently focused on applying this technology to impact a wide number of areas that use cell biology to create high-value products, ranging from cellular therapies and biologic pharmaceuticals to food and textiles. My goal is to make better products, faster.

Viktor Shkolnikov Principal Research Scientist HP-Labs

At HP Labs Viktor Shkolnikov leads a team of scientists and engineers to develop novel microfluidic and electrokinetic technology for solving valuable diagnostics problems, such as minimally invasive diagnosis of cancer (a project he conceived and initiated). His interests and expertise lie at the interface between medicine and fluid mechanics (and the associated physics, chemistry, and engineering) and he constantly seeks ways of how these can be leveraged to alleviate pain and improve health.

He is also the author of Principles of Microfluidics (https://www.amazon.com/dp/1790217288)
15:10 New Members Say ‘Hello’

**Emilie Collot AMF**

As pioneers in the revolutionary link between microfluidics and automation, we bring together a field, long considered as purely academic, into the industrial sector. With our innovative solutions, we strive to keep our clients satisfied by delivering high-performing and quality products. We are aiming to be the new reference for industrial microfluidics.

**Jennifer Ponti / Michael Deck : Web Industries**

Web Industries is a trusted contract manufacturing organization specializing in high-tech commercialization solutions for medical and diagnostic devices. Jennifer Ponti and Michael Deck have a combined 30 years of diagnostic and manufacturing expertise. Web’s team of engineers, chemists and business managers bring automated manufacturing technologies, combined with on-site chemistry preparation, rigorous quality systems, and structured process transfer procedures to help customers commercialize and scale up their products.

15:30 “Microfluidics Hot Seat”

Pitches from early stage microfluidics enabled companies in a ‘shark tank’ format

**Mais Jebrail - Miroculus**

Our Mission is to advance science and improve lives faster, together. Our Vision is to make the most complex protocols easy and accessible to scientists everywhere.

Miro Technology utilizes electromechanical forces to actuate droplets on the surfaces of insulated electrodes, without requiring immersion in oil or direct contact with system electronics.

Brief break while we set up for…
16:00 Working Session 4 – Using HP Inkjet Microfluidics for Life Sciences Research (by video link)

Ken Ward, Product Development Scientist HP Inc. Corvallis, Oregon

The first HP inkjet product for non-printing applications was developed and is being sold by the HP Specialty Printing Systems group.

Picoliter dispensing is improving pharmaceutical discovery workflows through unique advantages that will be demonstrated in this talk. In addition, microfluidic considerations in the design, development and deployment of this technology into this unique application space will be shown. And finally, future developments in both polymerase chain reaction (PCR) dispensing and cellular dispensing working towards 3D tissue construction will be discussed. Overall, applications of inkjet microfluidics into life science workflows represent significant advantages.

Ken Ward has a Chemistry Ph.D. in Quantitative Raman Spectroscopy from the University of Washington. He worked in Failure Analysis and Product Development primarily with FTIR microscopy at Sandia National Laboratory, Boeing and Thermo-Nicolet Instruments prior to his work at HP. Research at HP has focused on the developing non-printing applications of inkjet technology for life sciences, including dose response, DMPK, qPCR and most recently cell dispensing.

17:00 Way forward / member priorities and needs

- Upcoming programme:
  o Paris – Hosted by IPGG and Fluigent April 22/23
  o Boston (hosted by Broad Institute) June 10 .. plus reception with our cadet community ‘FluidicMEMs’ sponsored by Fluigent
  o London (hosted by Imperial College) – July 2 = day after the Cambridge Innovation Summit + Dinner at Trinity Hall Cambridge to which MF11 members have free access.

Interactive Session Led by Peter Hewkin

17:30 Close & opportunity for 1:2:1 meetings (please signal requests beforehand)

Transfer (beware of rush hour traffic; members might want to organize ride shares) to …. 
18:00 for 18:30

Evening programme with our West Coast community friends Bay Area Microfluidics Network with the theme “Synthetic Biology” – location Illumina Hayward Campus. 25861 Industrial Blvd. Hayward, CA 94545 USA. See maps in the Logistics Section below.

Bay Area Microfluidics Network

Generously sponsored by:

Networking, Talks, Buffet

Headline Theme: Synthetic Biology:

Lead Speakers

Andrea Bryan (Inscripta)

Kosuke Iwai (Sandia National Labs)

Moderated by

Don Arnold (Veristad)

Circa 21:00 close
Located in Silicon Valley, PARC is a renowned scientific research and Open Innovation company that’s been at the heart of some of the most important technological breakthroughs of our time. We bring leading scientists, engineers and designers together to form teams across a series of Focus Areas that we believe are the future of technology, science and innovation.

Creativity and science are core to PARC’s mission to reduce the time and risk attached to innovation. We draw on our revered history and our energy for the future to create technologies that improve our world and solve complex challenges.

Above all, working with PARC means benefiting from something unique. Because every technological challenge is different, the team you work with will assemble and grow organically, based on your innovation goals. This approach to combining expertise and capabilities has led to some of our most exciting R&D, technology and IP projects with startups, government agencies and Fortune 500 partners.

Our host Peter Kiesel is a Principal Scientist in PARC’s Electronics and Materials Laboratory. Peter conducts research in the areas of compact optical detection systems and ultra-sensitive light detection. His major interests focus on developing and fabricating novel optoelectronic devices and detection systems for applications in bio- and nanotechnology. He is an author or coauthor of more than 240 scientific publications including more than 90 refereed journal articles and four book chapters. He has organized many international workshops and conferences and has been the principal investigator on more than 20 research projects covering a large variety of optoelectronic devices. Peter has 80 issued US patents. Dr. Kiesel received a Ph.D. and Venia Legendi from the University of Erlangen, Germany.

Peter’s expertise and previous experience includes developing technologies such as:

· Fiber optic sensing system for structural health monitoring of civil structures to enable condition-based maintenance
· Optical sensing system for structural health monitoring of high voltage grid assets like transformer and voltage regulators
· Optical sensing in battery cells for enhanced battery management systems;
· Micro-fluidic-based optical detection platform for on-the-flow analyte testing;
· Spatially modulated excitation and emission technique for single particle detection with improved signal-to-noise discrimination which will ultimately enable Point-of-Care flow cytometers;
· Low-cost interrogation unit for wavelength-encoded optical sensors;
· Improved light/target interaction by guiding light in the analyte-containing medium;
- Cavity-enhanced sensing, a method enabling on-the-flow absorption and refractive index measurements in a microfluidic device;
- Chip-size spectrometer which enables fluorescence spectroscopy on a chip;
- Bio-detection based on native fluorescence spectroscopy;
- Exploring the material properties and potential applications of promising materials, like low-temperature grown GaAs, ZnO, and spontaneously ordered InGaP;
- Opto-optical switches, and polarization coded logic elements;
- Highly efficient light emitters, light modulators, sensitive photo detector

See location details in the logistics section below.

Arrivals and Registration 9:45 for start at 10:00

The outline programme is..

- 30 min - PARC exhibit
- 30 min - High level PARC overview
- 30 min - Photonics and micro-fluidic projects at PARC
- 30 min – PARC lab tour

Close circa 12:00 - Followed by informal lunch and networking in PARC cafeteria.
Earlybird Delegates are registered from:

10X Genomics (US)
AMF (CH)
Beckman Coulter (US)
Berkeley Lights (US)
BD (US)
CfBI (UK)
Edge Embossing (US)
Fluigent (F)
GE (S)
Danaher (US)
Dolomite (UK/US)
Heidenhain (US/CH)
HP Labs (US)
IMT (CH)
Idex (US)
IPGG (F)
Microcaps(CH)
Microculus (US)
Micronit (NL)
Nanocellect (US)
National Research Council of Canada (CAN)
Pall (US)
Phasethree Developments (US)
Philips (NL)
Posalux (CH)
Precigenome(US)
Protein Fluidics (US)
Sartorius (US)
Silex (US)
Susos (CH)
IPGG (F)
UC Berkeley (US)
UC Riverside (US)
UC Stanford (US)
Veristad (US)
Web Industries (US)
Xerox PARC (US)
z-microsystems (A)
Logistics:

Delegates are responsible for making their own travel and accommodation arrangements. Please tell us how you plan to travel and where you will be staying so we can offer taxi/transfer shares. The information below will facilitate this.

Orientation

Berkeley (MF11 Meeting Jan 30)  Oakland Airport  BAMN Eve Meeting Jan 30

San Francisco Airport  PARC  (Site visit Jan 31)
Location of Berkeley Campus

The Downtown Berkeley BART Station is located on Shattuck Avenue between Allston Way and Addison Street. It is conveniently located close to the University of California campus and to many shops, restaurants, theaters and other attractions, and has valet bike parking.

Meeting Venue Jan 30th

Meeting place is 3110 Etcheverry Hall: 2521 Hearst Ave, Berkeley, CA 94709 USA
Directions to the room: When entering the front door (3rd floor is street level), go past the cafe and around the corner to the right, and 3110 is about halfway down the hallway on the right. The wifi network is CalVisitor, no code required.
BAMN Evening Meeting

Orientation

Detail

Time: 6:00 – 9:00pm

Location: Illumina, 25861 Industrial Blvd, Hayward, CA 94545
PARC Site Visit

Orientation  SFO Airport  PARC

Detail

3333 Coyote Hill Rd #1314, Palo Alto, CA 94304, United States
Hotels

Of course, you can use the internet to find your own. The standard recommendation is Hotel Shattuck, Bancroft Hotel, Hotel Durant, Double Tree by Hilton Berkeley Marina, Claremont Hotel, as well as Faculty club and Women's Faculty club on campus. However..

..there is a special guest house in Berkeley lab called Berkeley Lab Guest House (http://www.berkeleylabguesthouse.org).

The address is: 1 Cyclotron Rd building 23, Berkeley, CA 94720, United States

It is an excellent place to see the spectacular view of the San Francisco. Members can make a reservation ahead since this is a popular place, but limited numbers of rooms. MF11 members can reserve a room after checking the 2nd button that you are visiting UC Berkeley (Lydia Sohn’s Lab you will need her email address which is sohn@berkeley.edu)(https://www.resontheweb.com/blgh.html).

Last minute ‘issues’?

Contact Peter Hewkin on:

- ceo@cfbi.com
- ++44 7951721110