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Short Course

Flow Cytometry Trends & Drivers (SC1150)

Course Level: Introductory

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Course Description

Flow cytometry is an extremely versatile optical cell analysis technology in widespread use. For example, it is the gold standard for monitoring of treatment for HIV patients, and the majority of the 200M+ routine blood tests performed worldwide per year are carried out on instruments based on flow cytometry engines. This course consists of two parts: (1) flow cytometry basics, and (2) trends and drivers. The first part will explain the basics of flow cytometry: the physical principles of the technique, typical system layout, critical photonic components, and application examples. You will walk away with a solid grasp of flow cytometry instrumentation and principles of operation. The second part will explore current trends in flow cytometry, focusing on the relationship between market drivers and technology enablers. You will receive an overview of current unmet needs, the latest innovations, and up-and-coming players.

Learning Outcomes

This course will enable you to:

- compare and contrast flow cytometry to microscopy, and highlight pros and cons of each
- name the most critical photonic components common to every flow cytometer
- explain the design principles behind different types of beam shaping
- identify the two most common schemes in use for light delivery and collection
- describe three architectures for spectral light detection
- diagram typical experimental outcomes of common flow cytometry assays, and link them to basic physical principles
- explain how different physical characteristics of cells affect different measurable parameters
- outline current market drivers
- list the top technology enablers
- relate recent technology innovations to application-side unmet needs
- identify significant new entrants to the flow cytometry market
- generate instrument specifications responsive to current market needs

Intended Audience

Scientists, engineers, technicians, managers, and people in sales/marketing functions who wish to learn more about the optical underpinnings of flow cytometry, as well as current technology trends and market drivers. Basic undergraduate training in engineering or science is assumed.

About the Instructor

[Giacomo Vacca](#) Ph.D. has designed and developed over a dozen flow cytometry systems, and regularly delivers flow cytometry seminars. He is founder and President of Kinetic River Corp., a biophotonics design, consulting, and product development firm, and is cofounder and Chief Scientific Officer of BeamWise, Inc., an optomechanical design automation company, both in Silicon Valley. Dr. Vacca is a Senior Member of both SPIE and OSA, was inducted as Research Fellow of the Volwiler Scientific Society at Abbott Laboratories, is a recipient of several awards for his research and inventions, and has been issued 20 patents. He holds a BA/MA in Physics from Harvard University and a PhD in Applied Physics from Stanford University.

Additional Notes

Attendee testimonial:

One of the best. Both the instructor and the course.[1/]

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