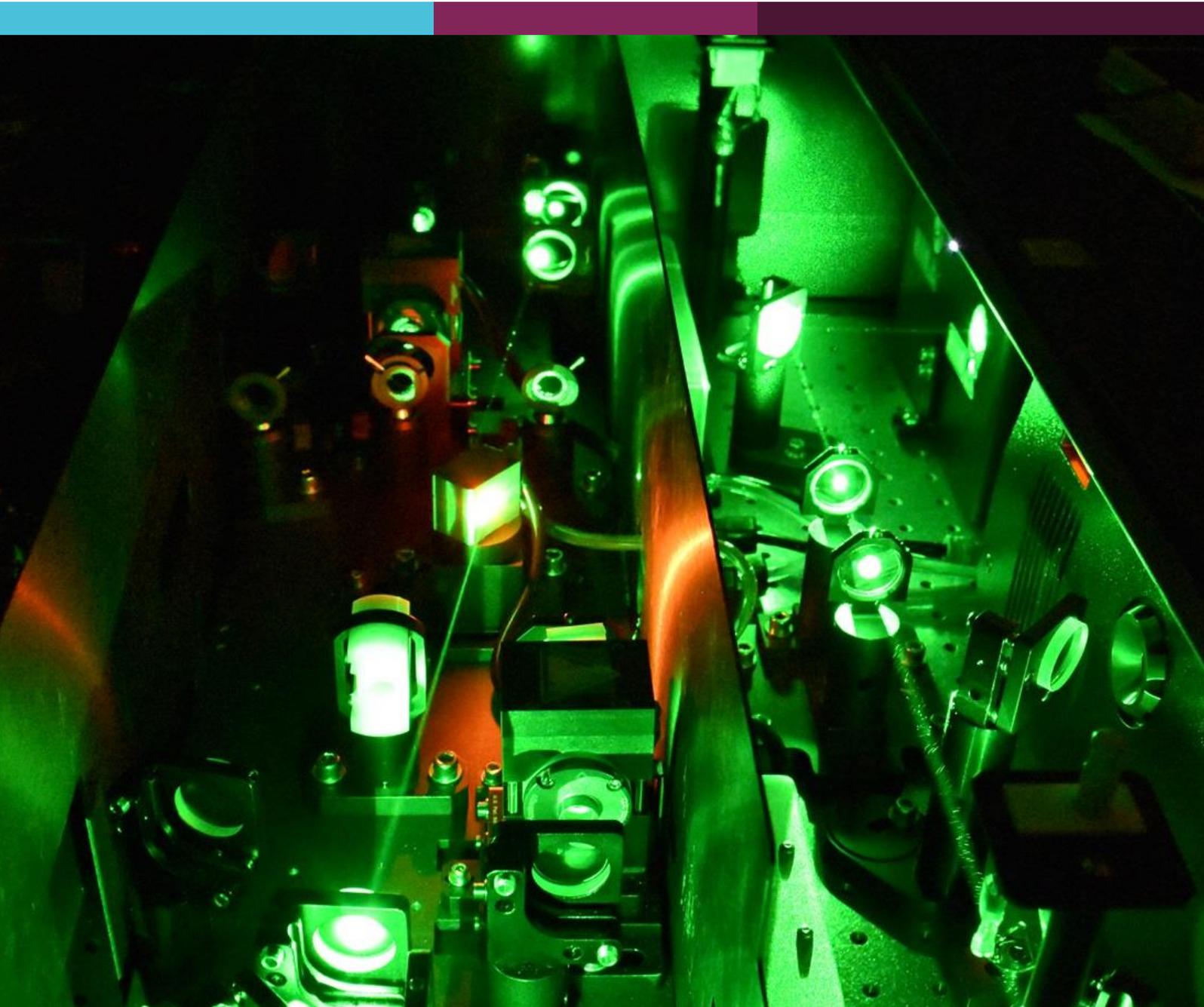
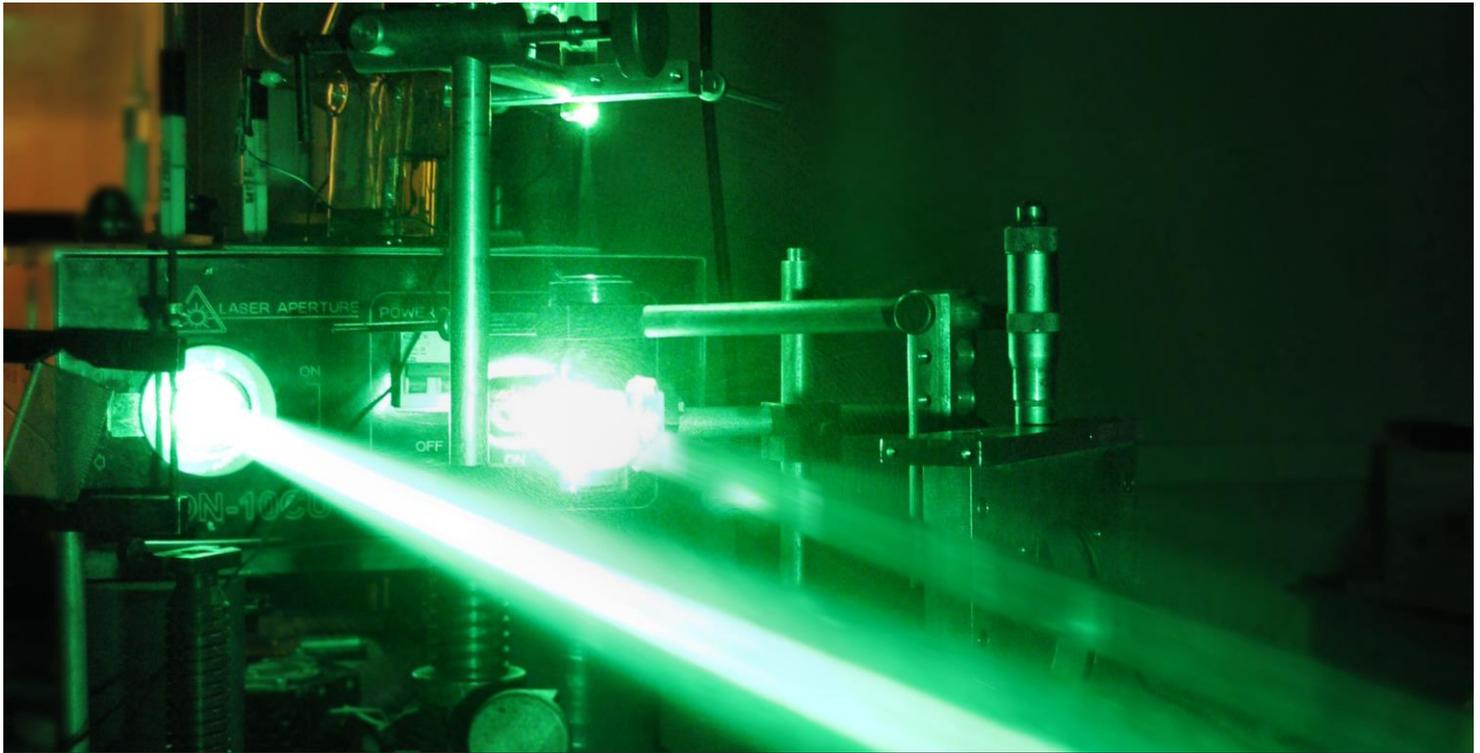


*Aekip SA*

*Photonics, Lasers & Spectroscopy*





## ***Aekip SA*** *Photonics, Lasers & Spectroscopy*

Aekip SA is a product supplier and engineering service provider company in Saint Sulpice, near to the EPFL. Aekip provides research and development, measurement and consulting services in the fields of lasers, spectroscopy and solar energy. In collaboration with the group of Prof. Jacques E. Moser at the EPFL, Aekip SA develops a compact prototype for THz endoscopy, in order to perform THz imaging and spectroscopy in vivo for cancer detection applications.

Aekip is founded by experts in lasers, spectroscopy and solar energy. Having highly qualified experts and being in close connection with laser and spectroscopy laboratories in the EPFL, makes us a strong and efficient group in design and implementation of optical setups and photonic systems; and in spectroscopy measurements.

### ***Product Development and Services***

**Development of THz Endoscopy  
System**

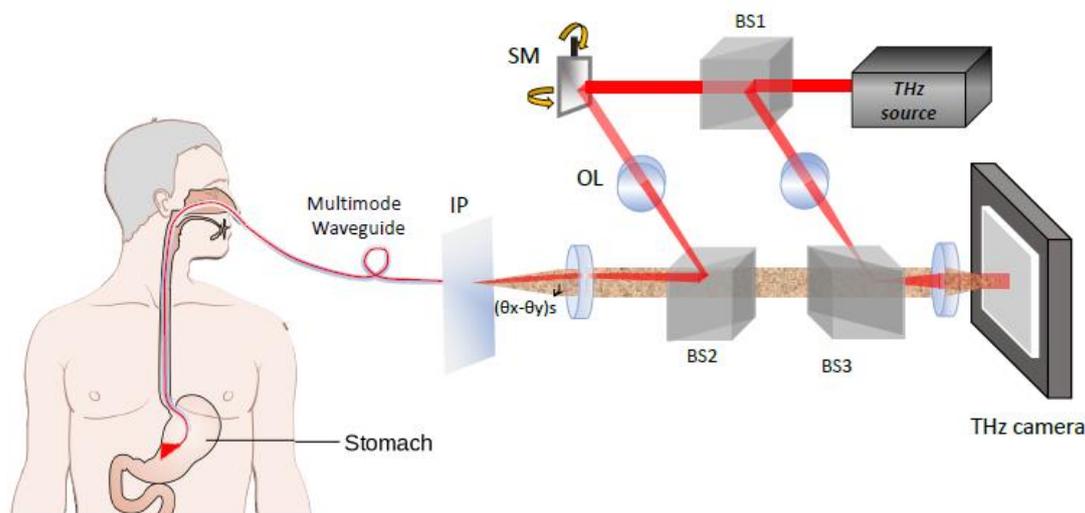
**Spectroscopy & Measurement  
Services**

**Design, Engineering &  
Consulting Services**



## Development of Terahertz Endoscopy Instrument: Targeting Bio-Medical Applications

In partnership with the group of Prof. Jacques E. Moser in EPFL and with support of the industrial project program in NCCR-MUST, we are developing a compact prototype for THz endoscopy, in order to perform THz imaging and spectroscopy in vivo. We aim in particular at cancer detection in hollow organs and in live tissues during surgery.



## Research and Development, Design and Engineering Services

Aekip is pleased to provide comprehensive solutions in photonics, laser systems, and spectroscopy, such as:

- Research, development and tests on solar cells
- Design and implementation of optical set-ups and spectroscopy systems
- Installation, commissioning and maintenance of lasers and optical systems
- Inspection and securing optical set-ups for safety aspects

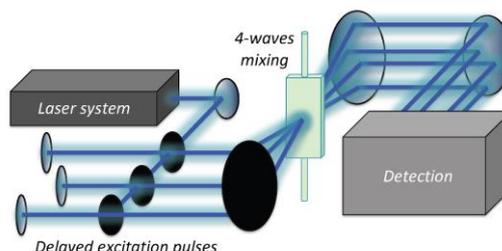
## Providing Experts and Consultants

Aekip addresses the need for specialized experts in photonics, lasers and spectroscopy, by providing highly experienced experts, project managers and engineers. Our experts are employed by Aekip and are mandated to work in our client's work environment or laboratory. **We offer short-term services (in daily or monthly basis); and long-term engagement (in yearly basis or longer), in full-time or part-time basis,** according to the needs of our clients.

Relying on our services, you do not need to spend your time and budget for finding qualified experts; instead, you can focus on the progress of your work and on obtaining expected results.

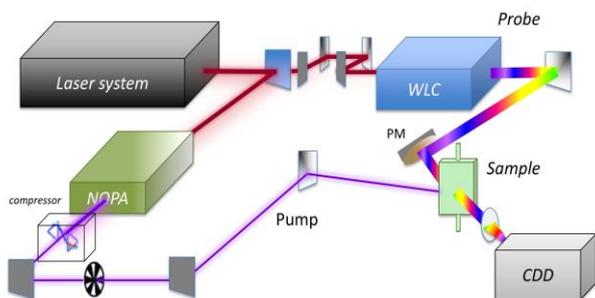
## Fields of Expertise

- Ultrafast Spectroscopy
- Femtosecond Lasers
- Nonlinear Optics
- Optical Spectroscopy
- THz Technology
- Solar Cells

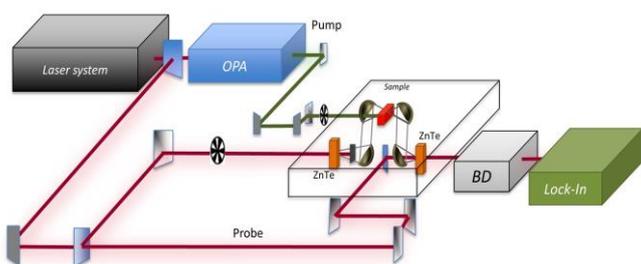


## Spectroscopy Measurements

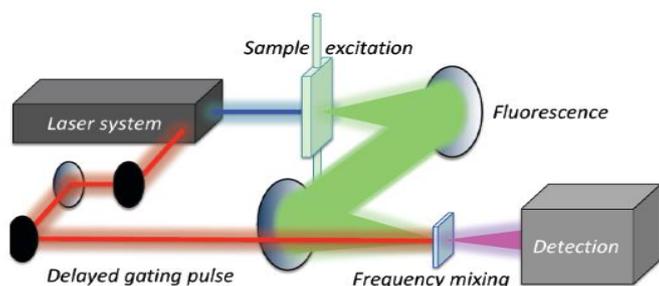
In collaboration with laboratories in the EPFL, we offer optical measurement services to our customers. We perform their needed spectroscopy experiments, and in particular ultrafast spectroscopy measurements on solid-state and liquid phase samples. We perform femtosecond experiments, such as:



**Transient Absorption TA (Pump-Probe) Measurements in UV, Visible and IR ranges:** TA spectroscopy probes the change in absorption after excitation of the sample with a femtosecond (fs) pulse. It provides both fs resolution and broadband detection, which give direct access to ground and excited state dynamics. TA signal contains contribution from ground state bleaching (GSB), excited state absorption (ESA), and stimulated emission (SE).



**Broadband THz Measurements (THz-TDS & Optical Pump -THz Probe):** THz spectroscopy is a technique to probe the absorbance and refractive index of far-IR (terahertz) radiation (~1THz) that determines frequency dependent complex susceptibility. Combined with an ultrashort optical pulse, one can study dynamics of photo-generated charge carriers and low frequency molecular vibrations in sub-ps regime, ideal for investigating primary light-induced events in light conversion devices.



**Fluorescence Up-Conversion Spectroscopy (FLUC) in UV, Visible & IR ranges:** It has been developed to avoid complexity of TA interpretation in particular at the earliest times. FLUC follows the temporal evolution of the emission from the pumped system, which allows monitoring the polarization with femtosecond resolution and broad-band detection including the UV range.

Set-up	Laser Source $\lambda$ (nm), Repetition Rate	Pump Beam $\lambda$ (nm)	Probe Beam $\lambda$ (nm), $\nu$ (THz)	$E$ ( $\mu$ J)	$\Delta T$ (fs)	$\Delta t$ (ps)	Detector	Detection Method
THz-TDS	800 1 kHz	235 – 2650	$\nu$ (THz): 0.1 to 2.5 (extendable to 20)	1- 200	400	0.4- 2000	Photo- diodes	Transmission / Reflection
TA	775 1kHz	450-700, 840 900-1500	Monochromatic & WLC 350-800 nm, WLC 800-1200 nm	6-12 2@840 nm	50	0.05 - 1500	CCD	Absorption
FLUC	800 150 kHz	250-300 400, 500-600	-	0.08/pulse	Vis: 100	0.1 - 1500	CCD	SHG

Wavelength ( $\lambda$ )  
Frequency ( $\nu$ )  
Temporal-Resolution ( $\Delta T$ )

Detection Temporal Range ( $\Delta t$ )  
Energy Range ( $E$ )

Fluorescence Up-Conversion Spectroscopy (FLUC)  
Terahertz time-domain spectroscopy (THz-TDS)  
Transient absorption (TA)  
White Light Continuum (WLC)

In addition to time-resolved measurements, we also perform steady-state experiments, such as:

- **Steady-State Absorption Spectroscopy**
- **Fluorescence Spectroscopy and Quantum Yield Measurements**

## Founders:

### Managing Director



Ahmad Ajdar-Zadeh

Expert in Femtosecond Lasers, Ultrafast Spectroscopy & Solar Cells  
PhD in Photonics, Electronic Engineer

Dr. Ahmad Ajdar-Zadeh is the co-founder and managing director of Aekip SA. In parallel, he is a scientific consultant in the group of Prof. Jacques E. Moser at the EPFL, where he performed his post-doctoral research in the field of femtosecond laser spectroscopy and its applications in solar cell investigations. He has achieved his PhD degree from the EPFL in photonics, doing his thesis in the group of Prof. Majed Chergui. He obtained his bachelors and Master's degrees in electronic engineering and physics. He has been working during the last 11 years with femtosecond laser systems, in various laboratories at the EPFL, in the University of Toronto in Canada and in CFEL-DESY in Hamburg, Germany (The group of Prof. Dwayne Miller). He has expertise and strong know-how in very advanced techniques of ultrafast spectroscopy, such as THz Time-resolved spectroscopy, Transient Absorption, Fluorescence Up-Conversion, Photon-Echo, etc, He is the co-author of several scientific articles in peer-reviewed international journals. In addition to his technical and scientific expertise, he has achieved extensive management and entrepreneurial skills, through founding two start-up companies, in addition to attending management and business courses at the EPFL and in MaRS, University of Toronto, such as: Project Management (EPFL), Leading a Team (EPFL), Transversal Leadership (EPFL), Negotiations (EPFL), Venture Challenge and Venture Plan (Founding and managing start-up companies - Venturelab, EPFL) and Business Strategy (MaRS, Toronto).

### Director

Olivier Bräm

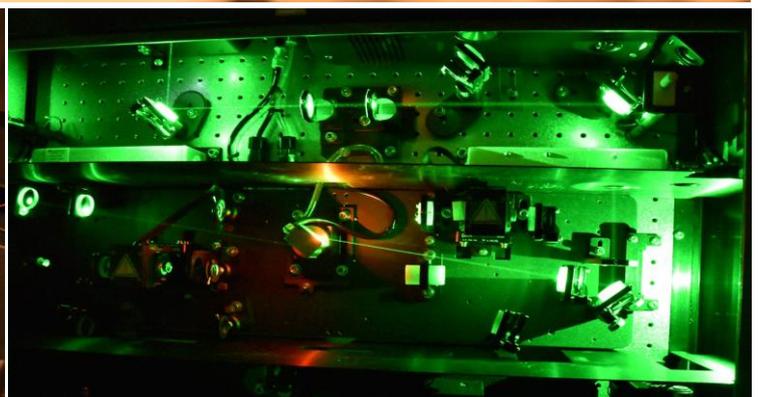
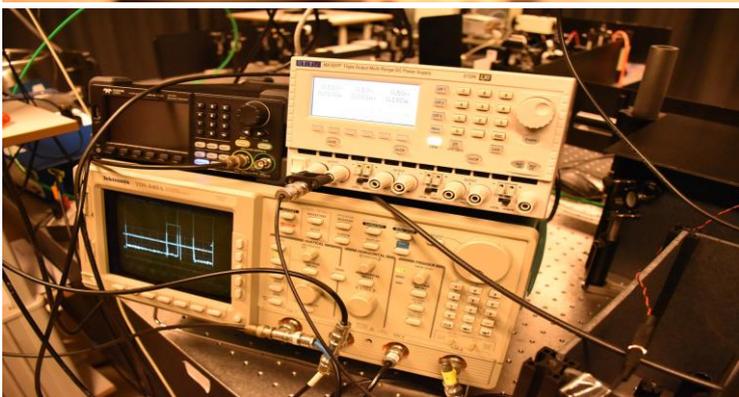
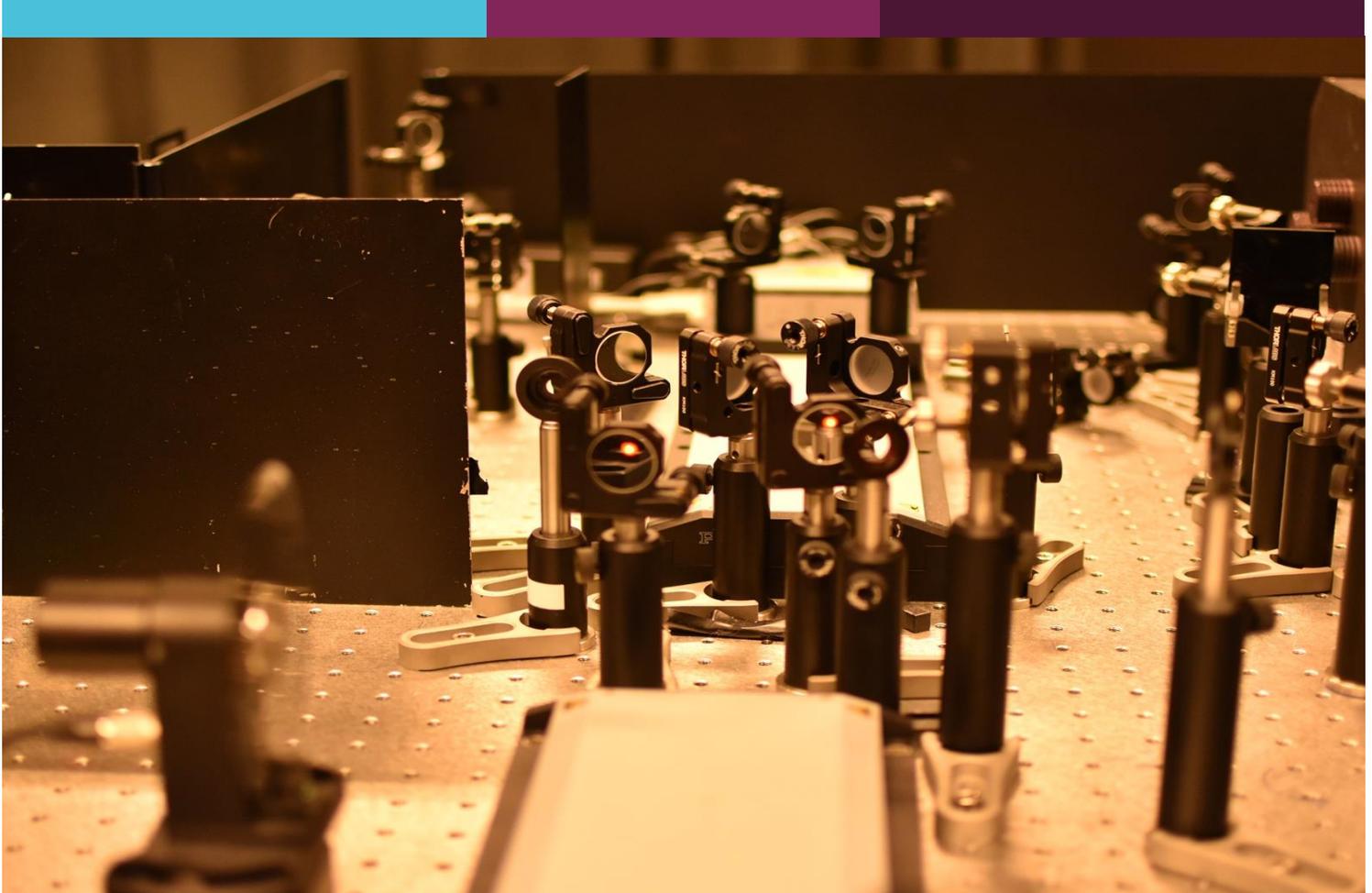
Expert in Femtosecond Lasers and Ultrafast Spectroscopy  
PhD in Physics - Lasers and Spectroscopy

Dr. Olivier Bräm is the co-founder and director of Aekip SA. He obtained his PhD in Physics and laser spectroscopy from the EPFL, doing his thesis in the group of Prof. Majed Chergui. He continued his research activities as a postdoctoral researcher at the EPFL. He has more than 7 years of experience in femtosecond lasers and spectroscopy, on several techniques such as Fluorescence Up-Conversion and Transient Absorption. He is the author of several articles published in international journals. He has also been attending several management courses at the EPFL.



**Aekip is pleased to serve companies and academic laboratories in Switzerland and abroad on their laser, spectroscopy and solar energy projects.**

**In order to obtain more information on our services, please contact us.**



**Aekip SA**

Rue du Centre, 140  
1025, Saint-Sulpice  
Switzerland



[www.aekip.ch](http://www.aekip.ch)  
[info@aekip.ch](mailto:info@aekip.ch)  
+41 21 534 5612  
+41 78 749 4341