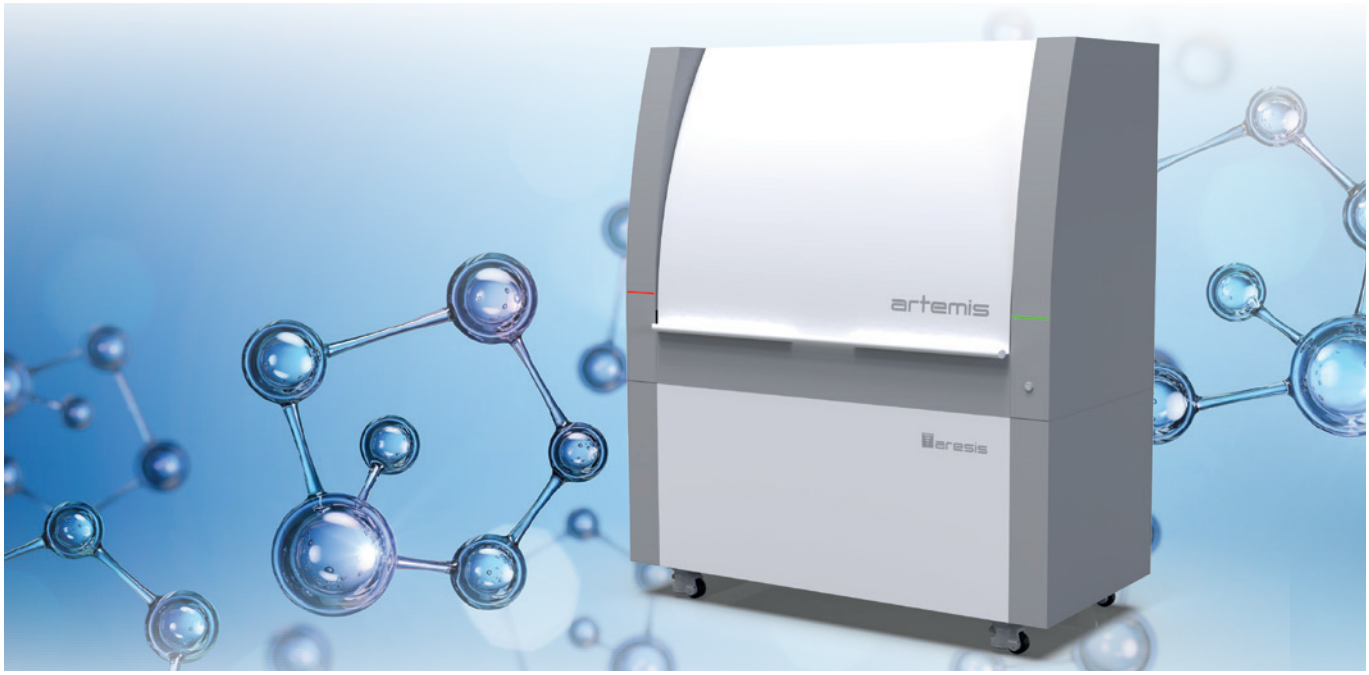
Artemis
The Workstation for Advanced Microscopy in Life Science.



What is Artemis?
Artemis is a modular platform that combines inverted microscopy, optical tweezers, advanced imaging, and microfluidics in one system.

It delivers flexibility and scalability to cutting-edge biophysical research.

Modular Workstation Design
Artemis features a modular design allowing customizable and expandable configurations for evolving research needs.

Advanced Biophysical Technologies
The platform can integrate an inverted microscope, optical tweezers, fluorescence, microfluidic pump system, Raman microscopy, and TIRF imaging for versatile analysis.

Future-Proof and Scalable
Designed to support seamless integration of new technologies and fostering scientific innovation. This makes the system future-proof and eliminates the need to invest in different systems.

Applications
Artemis is ideal for diverse biophysics and life sciences applications requiring robust performance and flexibility:
- Cell mechanics
- Cell diagnostics and sorting
- Microrheology for microenvironment studies
- Single molecule force spectroscopy
- Colloidal physics
- Physics of liquid crystals

Artemis system configuration
The Artemis platform supports a comprehensive suite of techniques to meet the diverse needs of biophysical research. The available instruments includes the Nikon Ti2 inverted microscope, the Tweez305, a state-of-the-art optical tweezer system, and the FluoLED fluorescence module. Additionally, up to 8-channel microfluidic pump system, is available for supporting the microfluidic liquid handling.

All components are connected via Python with a common software package that enables hardware synchronization and time stamping of the different instruments. The platform offers an active vibration isolation and a laser class 1 enclosure.

Total-Internal-Reflection-Fluorescence-Microscopy (TIRF) Module
The TIRF module is at the proof-of-principle stage, showing promising initial imaging results for future deployment.

Planned Confocal and Raman Modules
Confocal microscopy and Raman spectroscopy modules are planned to enhance research capabilities. Launch expected to be in 2026.

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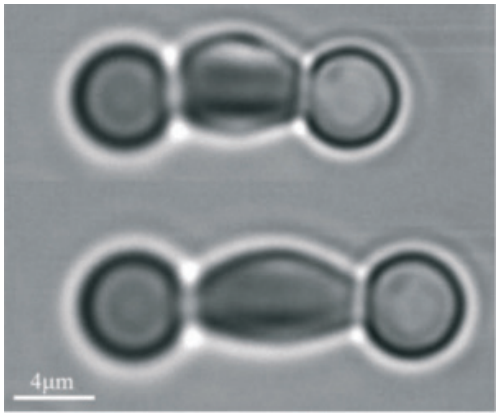
Platform Specs

Nikon Ti2
- Inverted research microscope
- 25mm field of view
- 60x objective with high NA
- Customizable with all Artemis modules

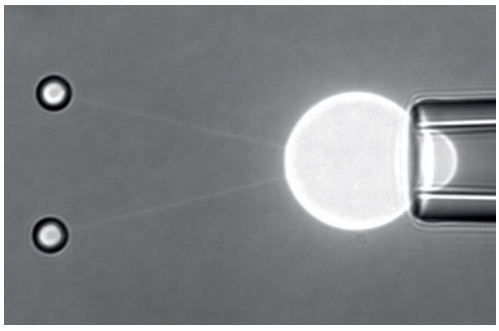
Tweez305
- Up to 2500 time-multiplexed optical traps
- 100 kHz trap to trap switching rate
- Computer controlled movement of simple traps and complex trap patterns
- AOD based XY trap position and strength control with sub nm positioning resolution, flat field compensation and AOD response linearization
- Independent trap strength control
- Working field: typ. 120x120µm²
- Motorized Z trapping independent of focus stage for up to ten traps
- Camera based force measurement; Force resolution: < 100 fN
- Python scripting

FluoLED 6:
- DAPI/FITC/Cy3/Cy5 as standard configuration
- Up to 6 excitation wavelength on request
- Temperature stabilized LED sources to provide stable and repeatable emission spectra
- Fast analogue and digital source modulation (100kHz)
- Multispectral imaging support (MSFI)
- Long lifetime of LED sources (expected >25000 hours)

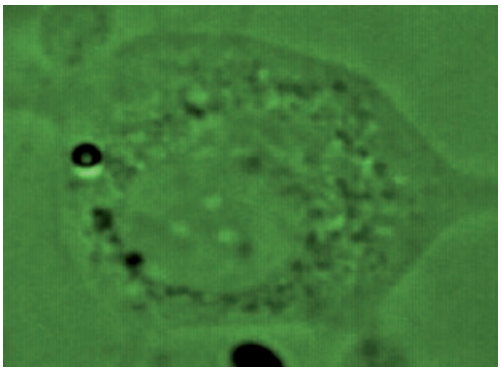
FluidWiz-10
- Up to 8 syringe pumps
- 60 mm stroke
- Linear resolution (minimal pump movement): 12.4 nm
- Maximum piston pushing force >100 N
- 1 | 2,5 | 5 | 10 | 25 | 50 ml syringes available
- Maximum pressure up to 8 bar
- Maximum flow-rate up to 50 ml/min depending on syringe volume
- Minimum flow-rate down to 0.0124 µl/min depending on syringe volume



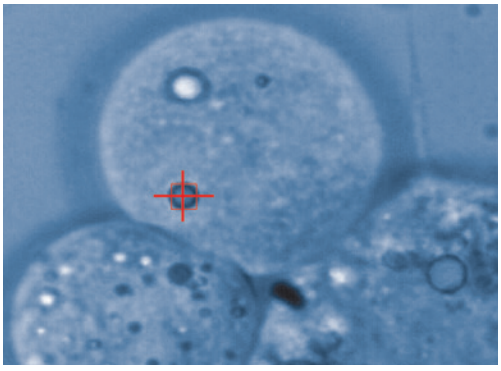
Red blood cells between two beads



Thethers pulled from a vesicle



Biophysics application



Colloid manipulation

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