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Direct viewing of the sample through the observer's eyes plays an ever-decreasing role in modern microscopy. New applications such as confocal and multiphoton microscopy, ratio-imaging, FRET, TIRF, FLIM, which require a plurality of different ways to illuminate the specimen and to detect the resulting signal, were adapted to existing microscopes rather than vice versa, placing numerous constraints on the user. Our team has adopted a different approach, redesigning the tool to fit the method. We have taken all the known applications together, dis**TILL**ed the essence of what microscopy is or might be in the future, and tried to design something which reduces the microscope to its essential, the objective, made the optical path as accessible as possible, and out came a design which places the objective in the very middle. The **iMIC** is a motorized, automation-ready, octagonally-shaped platform with an optical axis in its center of symmetry.

"Beam-hub" elements comprising up to eight input and/or output ports, can be arranged in a stack, whose symmetry axis coincides with the optical axis. Ports are arranged radially and can be addressed by central beam multiplexer elements, which determine not only the direction of the beam, but also its spectral composition or polarization. The centralized design, the accessibility of the optical paths and the flexibility of the ports allow to add lenses, filters, masks or other means to affect or modify the properties of either the input or the output and to switch between sources and detectors.

For widefield illumination a new generation of the TILL monochromator light source was developed, the **Polychrome-V**. It proved fiber-coupled, laser-like brightness (8 – 16 mW) with tunability between 340 and 680 nm. For focused laser-illumination, a laser scanhead (**Yanus-II**) was developed, comprising a centro-symmetrical transfer optics, which images both scan mirrors onto each other. This results in a stationary beam on both scan-mirrors. Both light sources comprise a novel, DSP-driven scanner electronics, which is based on the physical model of the galvanometers. A digital signal processor fits the driving signal to this physical model and applies the optimal driving voltage to achieve fast and precise movements. Speed and accuracy of this system are limited only by the physical limits of the galvos.