

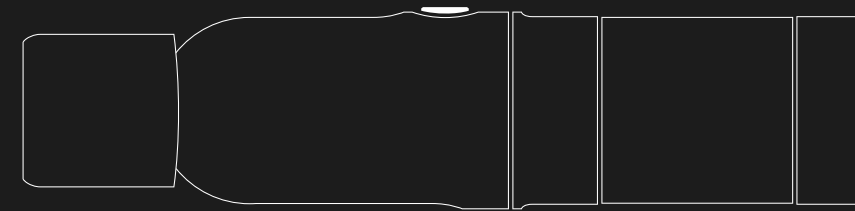
PROJECT 01

MICROSCOPE

The digital world defines more and more our daily routine. Traditional optical instruments are replaced by modernized variations. Of course we can find digitalized high-tech microscopes in laboratories but the technology is mostly not accessible for the home-microscopist much less for kids. Skop should help to make microscopy attractive for young generations by combining the digital advantages with a rethought architecture of an optical microscope.

UNIVERSITY PROJECT 2016

BACHELOR THESIS
WUPPERTAL, GE



» CAN A MICROSCOPE BE
MODERNIZED FOR THE NEXT
GENERATION OF EXPLORERS ? «

INDIVIDUAL WORK ●

INDUSTRIAL DESIGN | BRANDING
UI/UX

skop

WHAT ARE THE MAJOR PROBLEMS ?

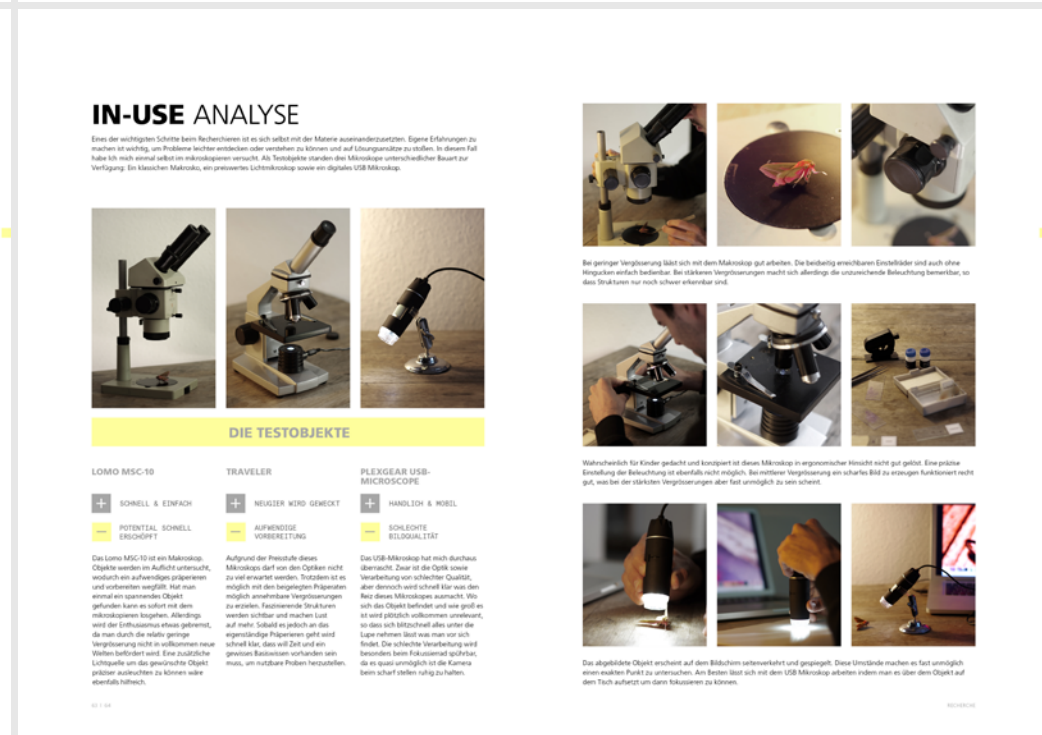
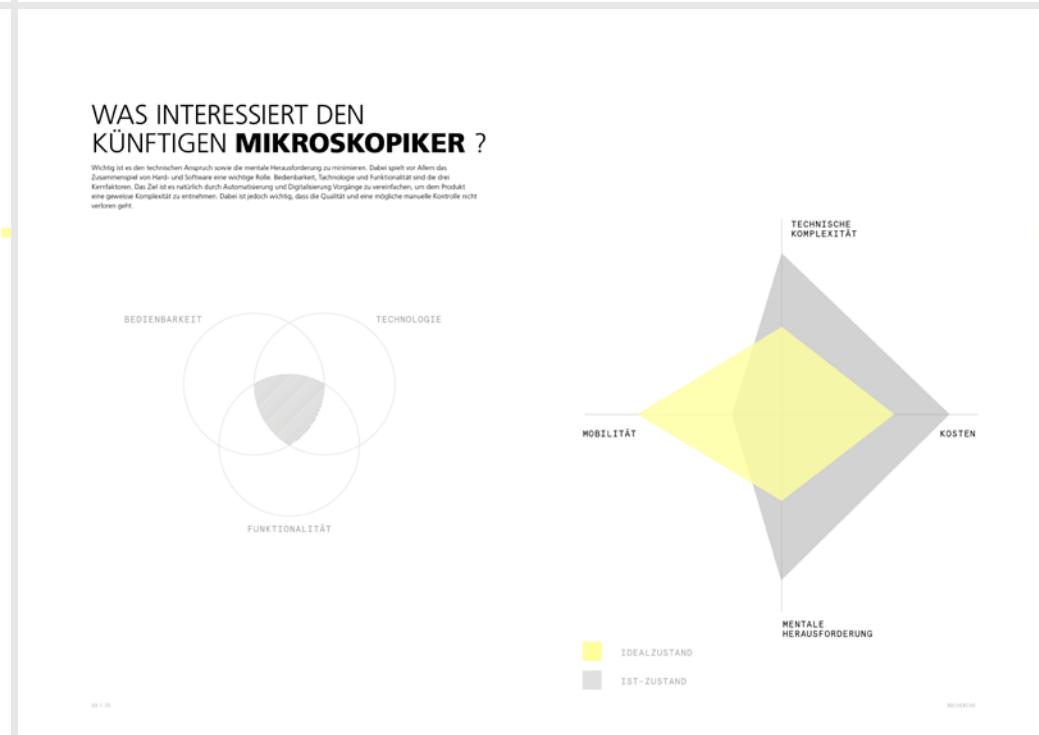
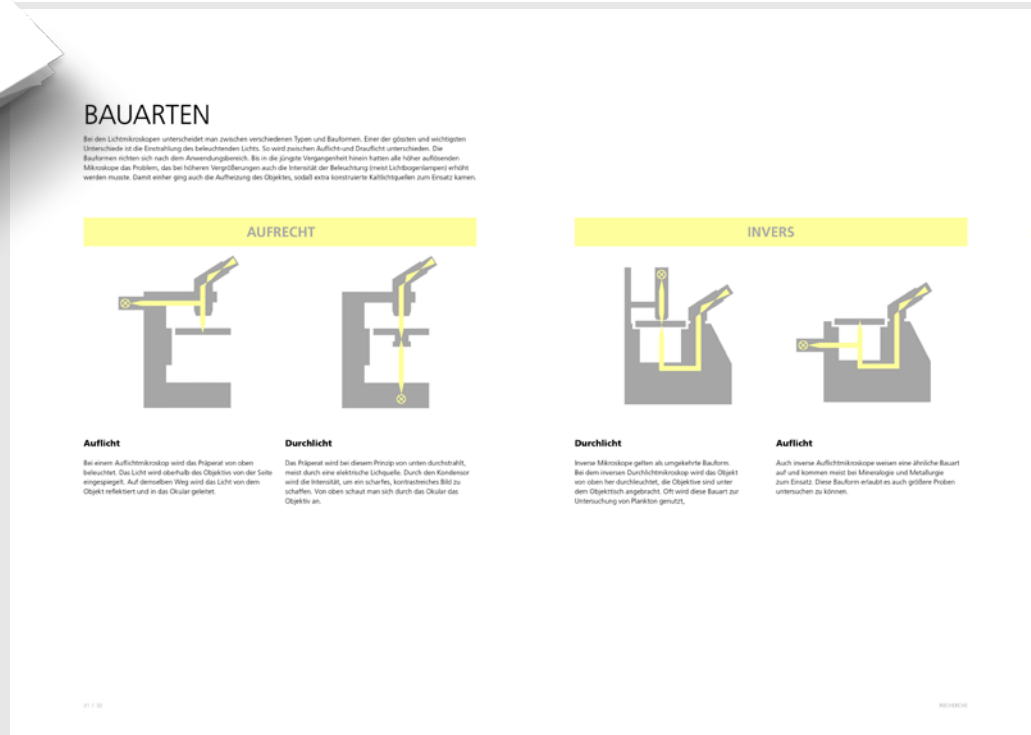
Diagram illustrating the hierarchy of biological organization and the corresponding range of microscopy techniques:

- ATOM** (0.1 nm)
- MOLEKÜL** (1 nm)
- PROTEIN** (10 nm)
- VIRUS** (100 nm)
- MITOCHONDRIUM** (1 µm)
- BAKTERIUM** (1 µm)
- TYPISCHE ZELLE** (10 µm)
- PILAR** (100 µm)
- ANTIKE** (1 mm)

Microscopy techniques and their ranges:

- Elektronenmikroskopie** (0.05 - 0.1 nm)
- Lichtmikroskopie** (200 - 300 nm)
- Röntgenstrahlungsmikroskopie** (100 - 300 µm)

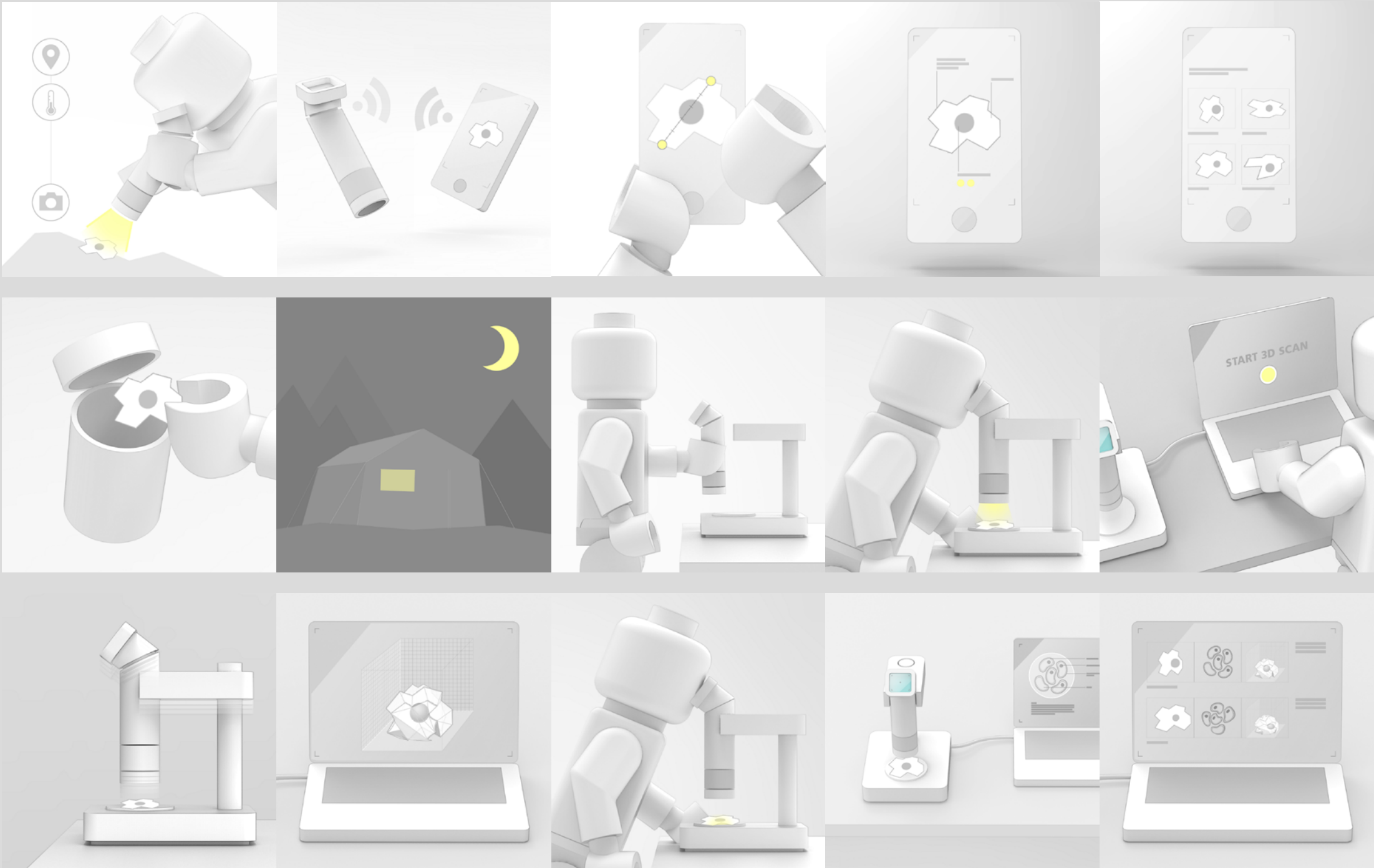
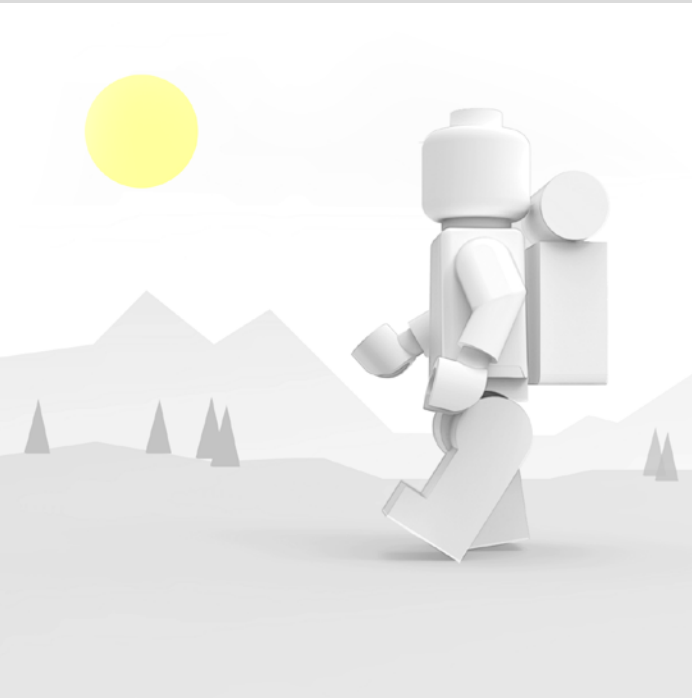
A box indicates **AUSRICHTUNGSSYSTEME ab etwa 25 cm** between the Mitochondrium and Bakterium levels.



CREATE USE CASES

USER INTERACTION

Once you start to rethink a whole product category it is important to understand how the user interaction will be. Storyboards helped me to figure out where new possibilities are and what will be necessary to create a successful product. How does the user interact with the product? And how do the single components of the system interact with each other. In this case I built three short stories with different users to cover a variety of applications. Here is one of them.

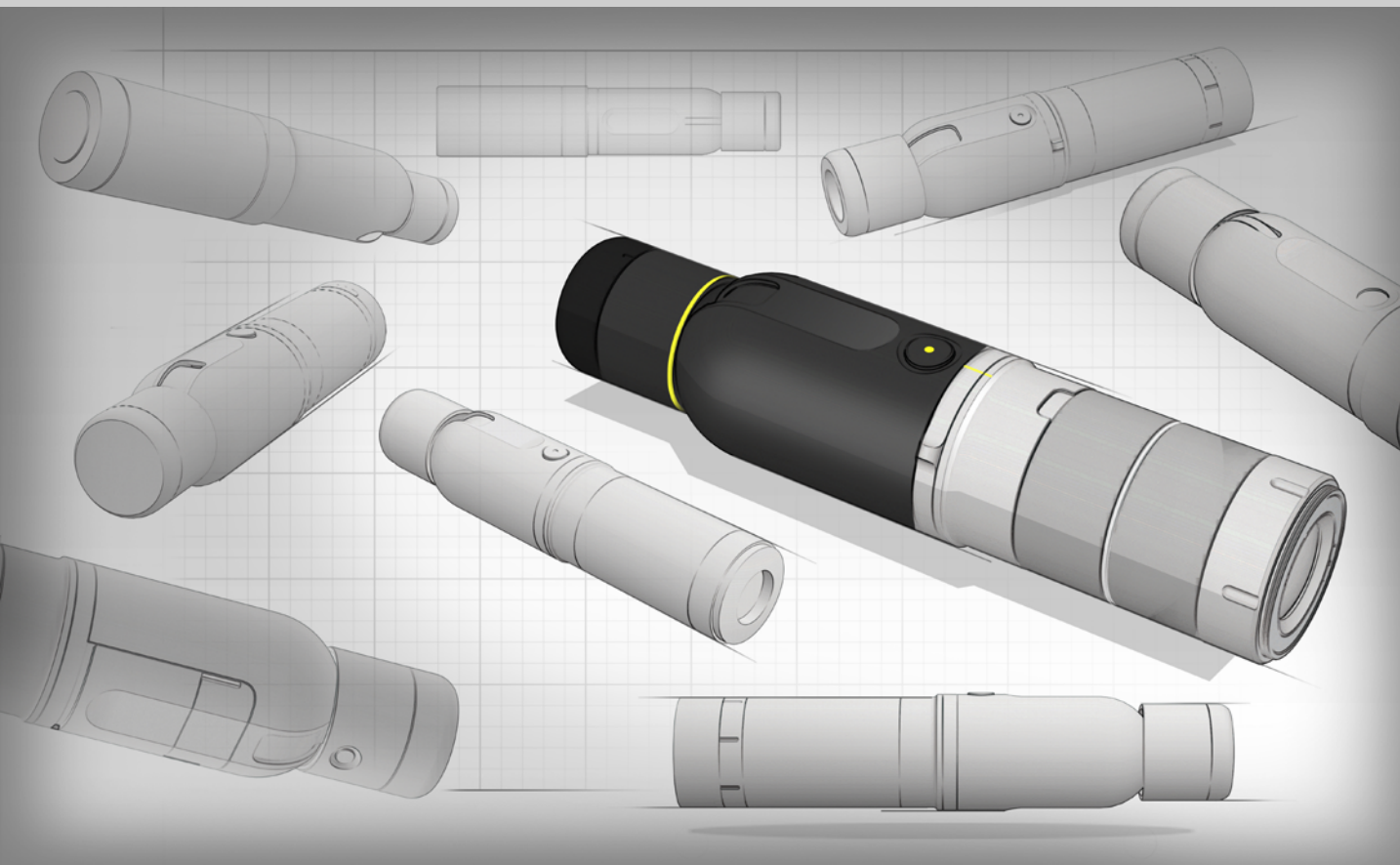
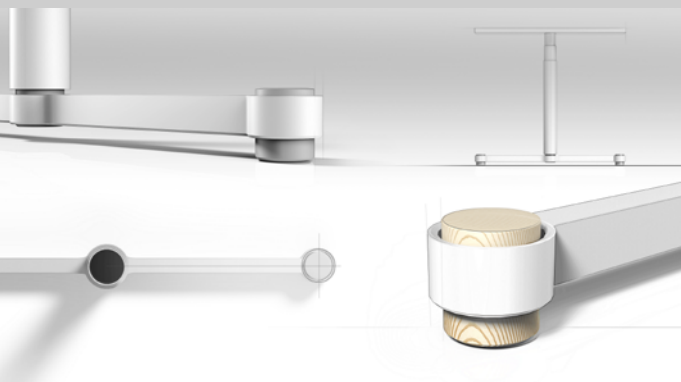
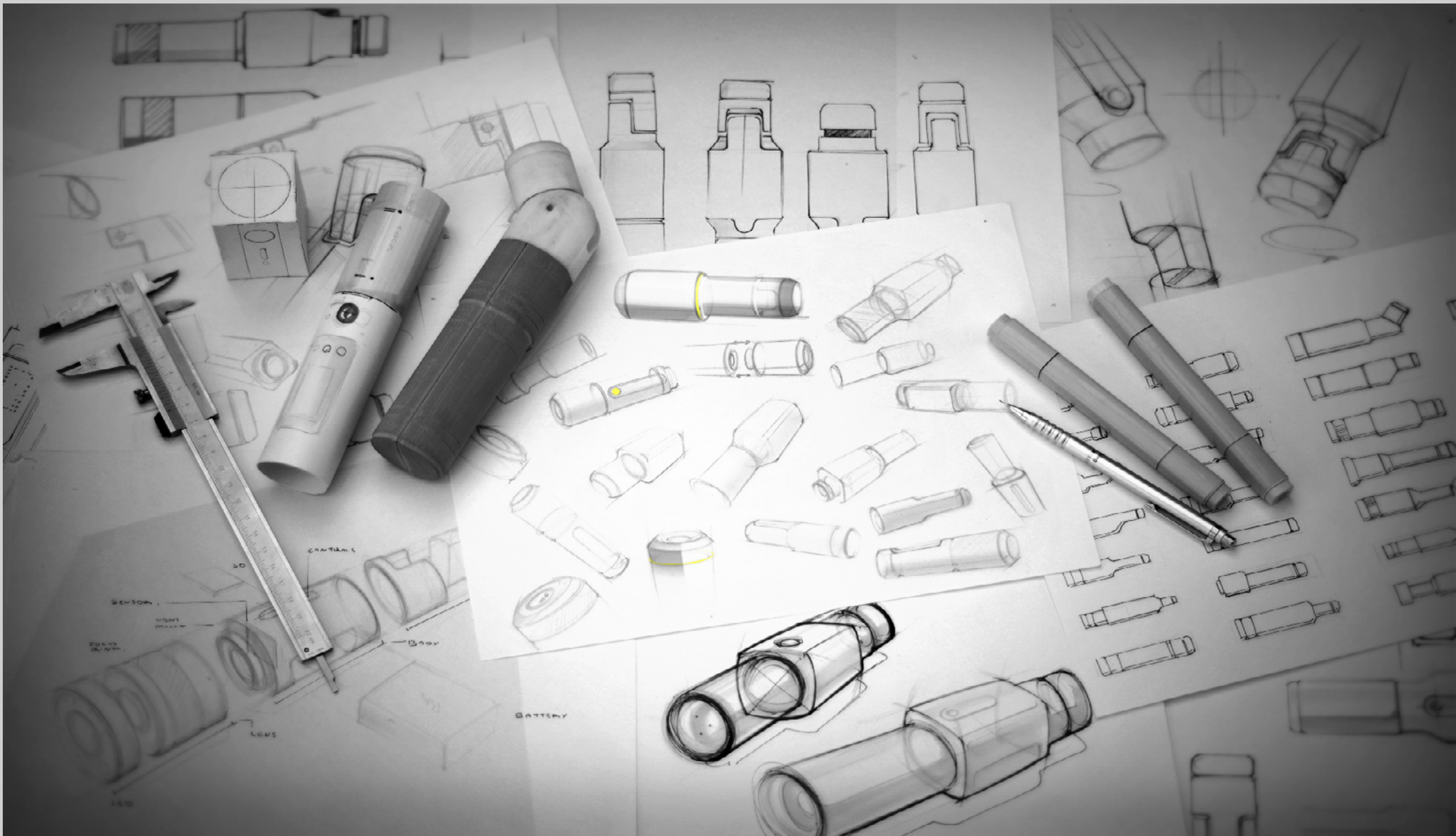


CONCEPTUALIZATION

During the conceptualization it was helpful to categorize which concepts will mostly drive the design to figure out what the re-designed architecture should look like.

DESIGN EXPLORATION
PROCESS

After determining the constraints and rough dimensions the challenge was to find a bold silhouette to embody the new kind of product. The rotatable electronic view finder had the biggest effect on the final design. Besides the product design it was important to build a strong brand identity.



skop



SKOP NEXT GEN MICROSCOPE

SKOP is the first connected mobile microscope. With it's compact size you can bring it everywhere you want and explore new worlds outdoors just wherever you are.

160° ROTATABLE
ELECTRONIC VIEW FINDER

MAGNIFICATION

MANUAL FOCUS

LIGHT INTENSITY

DIOPTRE
COMPENSATION

LED DISPLAY

SHUTTER BUTTON

MODE DIAL

MAGNIFICATION
LEVEL



A MODULAR SYSTEM

START BASIC. EXPAND OVER TIME.

skop is perfect for beginners to start with a basic kit. With several different lenses, filters, view finders, stands and other accessories you can expand and customize your setup over time. This allows you to use skop for many different applications and help to keep microscopy interesting and fascinating.



FULLY DEMOUNTABLE

The body of skop is the centerpiece. A large sensor ensures high resolution images even in large magnifications. The user can choose from different modules like viewfinders and lenses



FILTERS

Depending on the lens it is possible to attach different filters like Polarizing or UV.

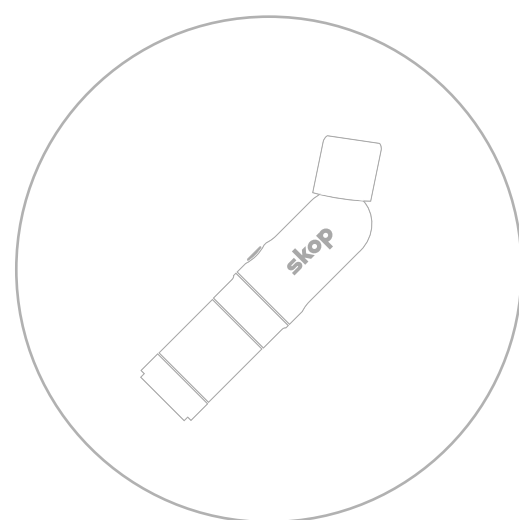


A LARGE VARIETY

With a number of different lenses everyone can configure skop just as he needs. It also gives the possibility to upgrade your system with high quality optical lenses from time to time.

STAND ALONE **VS.** CONNECTED

MACRO 2-50X

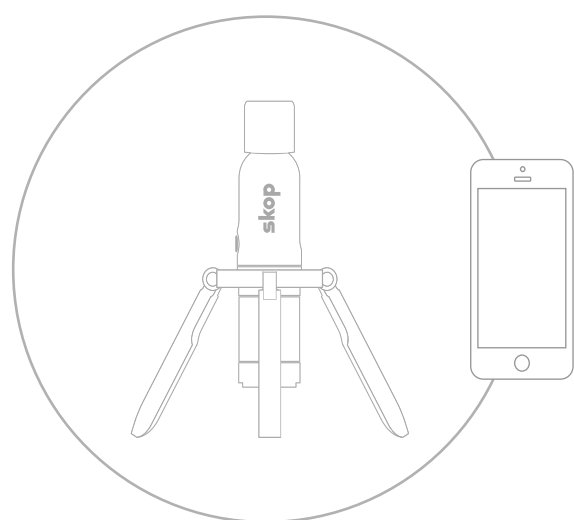


STAND ALONE MODE

In 'STAND ALONE MODE' the user has the possibility to switch between manual and automatic mode. The projected image is visible through a high resolution OLED electronic view finder to capture every last detail. A LED ring light provides a controllable illumination source.



MACRO + 20-100X

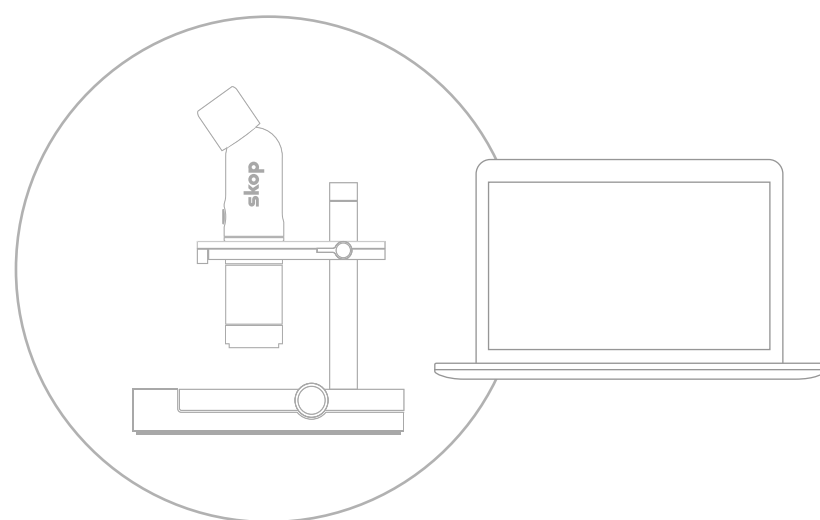


CONNECTED MODE

Connected to a smartphone the display turns into a large viewfinder and gives the user full control. Precisely every setting can be adjusted on the display and viewed in real time. Attached to a foldable tripod it becomes the perfect instrument for exploring the micro-cosm outdoors wherever you are.



MICRO 80-400X



DISCOVERY MODE

In discovery mode skop enables entirely new capabilities. A stable stand with transmitted light and motorized table allows to dive into entirely new worlds in high magnifications. Connected to a laptop a large data base and augmented reality technology helps to detect and explain unknown structures and organisms.



STAND ALONE MODE

MACRO MODE

In Macro Mode the user can choose between fully automatic or manual mode. In manual mode he's able to adjust aperture, shutter speed and light intensity as well as changing the level of magnification. Set to automatic mode everything will adjust itself by slightly pressing the shutter button. This is perfect for beginners to get great results.



MODE

LENS

MAGNIFICATION
APERTURE
ISO
SHUTTER SPEED
FLASH



DISCOVER WHEREVER YOU ARE

A high resolution OLED electronic view finder allows you to capture every last detail in real time. To discover every object from the perfect angle the 160° rotatable view finder helps you to stay in a comfortable position.

CONNECTED MODE
MACRO +

Macro + is probably the biggest innovation of the skop system. Connected to your App and attached to a foldable tripod the user is able to explore right in the field with higher magnifications.



FOLDABLE TRIPOD

Collapsed the tripod is compact and perfect for traveling. By rotating each leg 120° degrees the tripod provides a stable standing.



APP CONNECTED

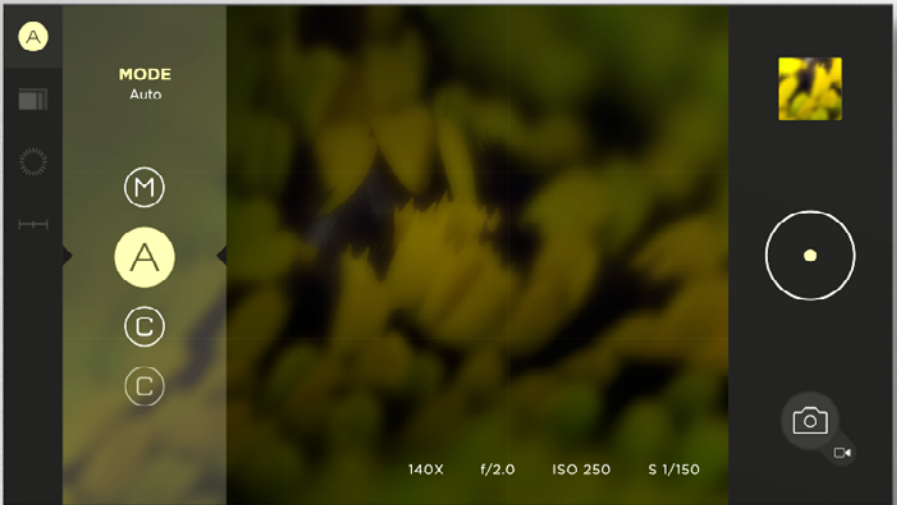
The App on your Smartphone gives you full control and turns your display in a large, beautiful viewfinder



SOFTWARE

TAKE FULL CONTROL

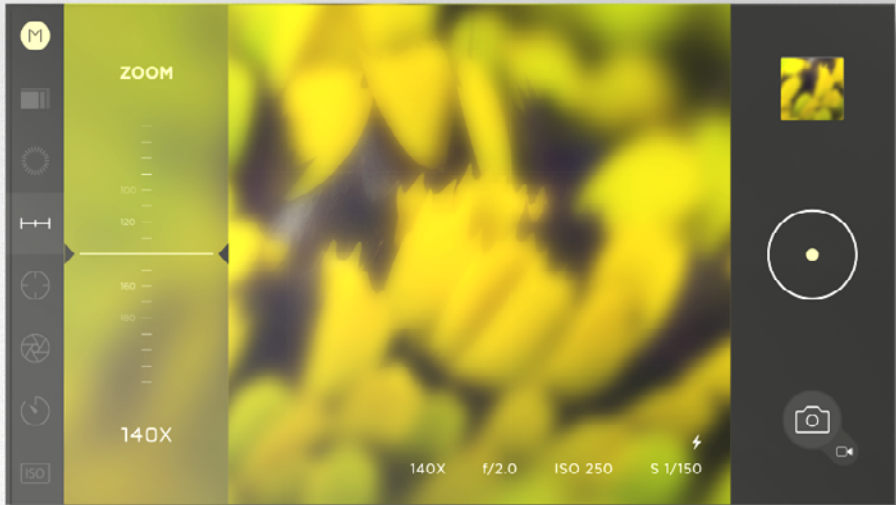
Connected to the App you get the full control on your smartphone. Turn your display into a large viewfinder and capture every detail. Functioning as remote control you can adjust settings and easily take pictures and videos.



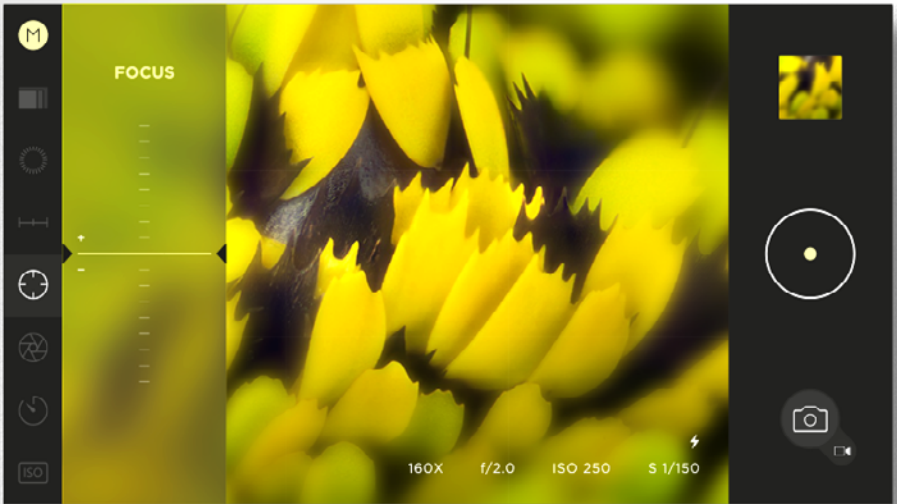
Choose between all automatic or fully manual mode.



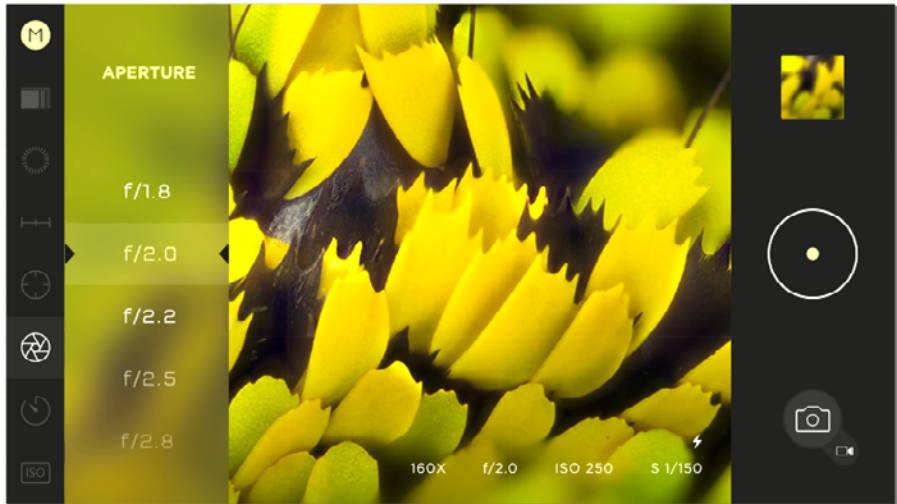
Homogeneous light from top or high-contrast angular light is possible.



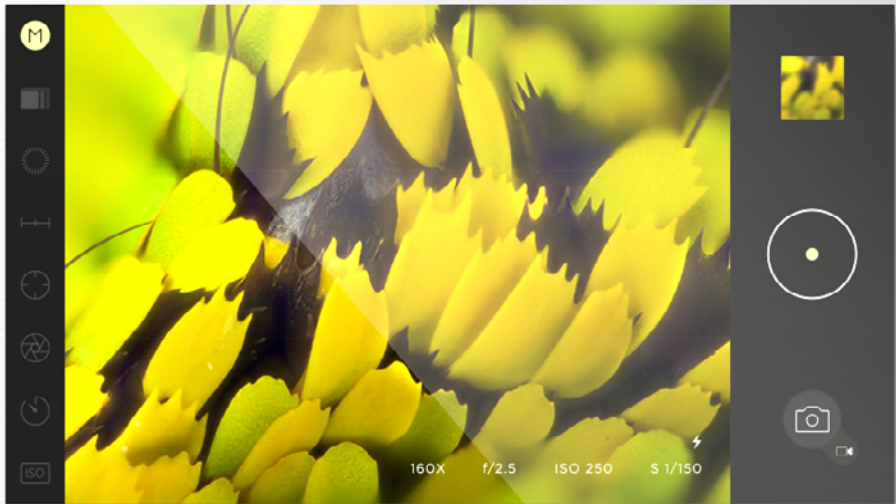
Zoom easily in and out to find the desired image detail.



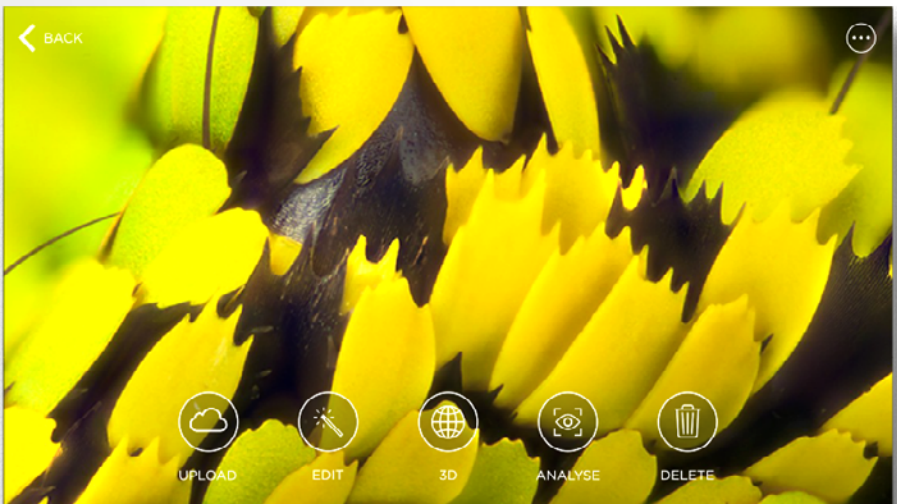
Focus.



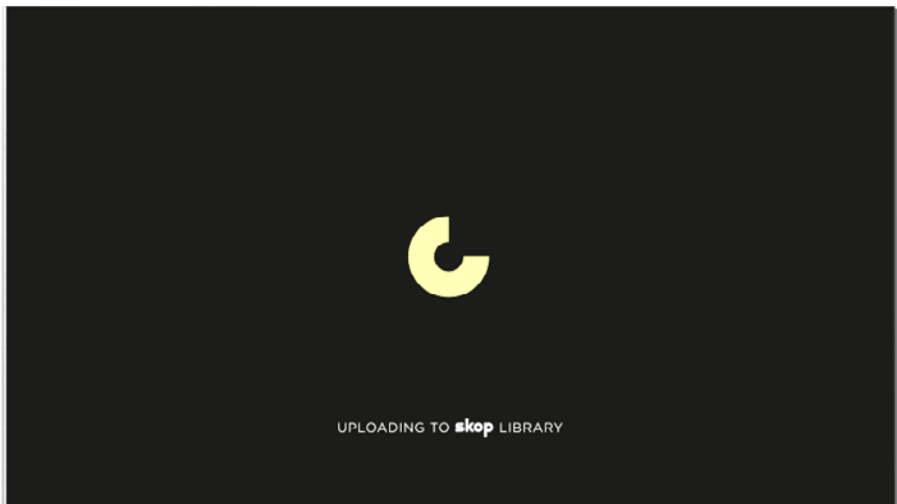
Adjust aperture.



Take a snap!



Share it with you friends or the skop community.



DISCOVERY MODE
MICRO

Connected to your stand at home skop offers entirely new possibilities. With transmitted light and a motorized table the user can explore unknown worlds. Up to a magnification of 400x! Connected to a smartphone or laptop a complex software with a large data base and augmented reality technology will help you to detect and explain unknown structures and organisms.



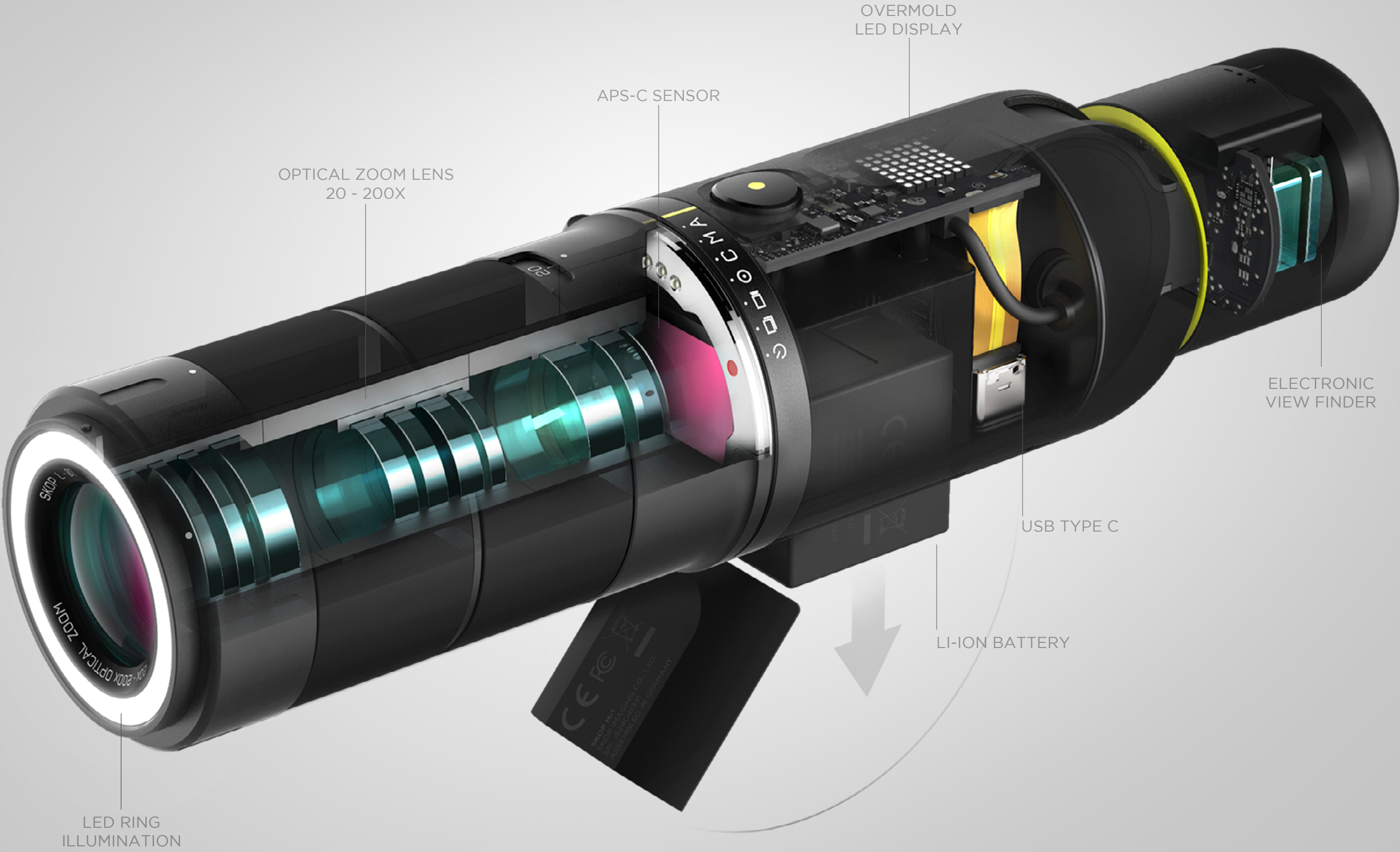
CREATING 3D SIMULATIONS

With the fully motorized table skop is able to create 3D images and animations through z-stacking. The software is able to analyze and evaluate the surface. This could especially be interesting for professional use as quality control for example.



SPECIFICATIONS

TECH TALK



DIMENSIONS
130 X 80 mm



BATTERY
1500mAh Li-Ion



ELECTRONIC VIEW FINDER
0,5" OLED



SKOP APP
FULL CONTROL, PARTIAL IL-
LUMINATION CONTROL



ELECTRONIC IMAGE STABILIZER
ANTI SHAKE



SENSOR APS-C
22,20 x 14,80 mm



CONNECTIVITY
WiFi & NFC



ON DEVICE CONTROLS
FOCUS,MAGNIFICATION,
ILLUMINATION,SHUTTER

LED RING ILLUMINATION
360° RING ILLUMINATION
4 SINGLE LED SECTIONS

