



MEDIA KIT

CREAL, founded in 2017 and based in the EPFL Innovation Park in Switzerland, envisions Augmented Reality to be the next major communication platform within this decade. This is why the startup is developing the natural display for AR to be fully accepted and used as an everyday tool from cooking to neurosurgery. By developing the light-field display technology, CREAL will enable AR glasses manufacturers to provide their clients with perfectly natural virtual images including genuine depth for comfortable and fully immersive experiences.

### CREAL's light-field display technology bringing AR within arm's reach

Let's make a simple vision test. Close one eye, and look with the other one at your finger in front of you. You will notice that you see it sharp, since you focus on it. What you may never have noticed is that everything around, except from your finger, is blurred. If you now look beyond your finger and focus on another object further, that object will come into focus and your finger will now become blurred. This simple test shows how our three-dimensional perception works with optical depth.

Until today, most AR and VR devices are ignoring this natural focusing function of our eyes. They project the virtual images at approximately 1.4m from the user, on a flat display (just like any screen), meaning we can see the virtual image sharp only when our eye focuses at the distance of the display. However, if the user wants to look at a virtual ob-

ject at a different distance than the one of the display, there will be a focal rivalry happening: the virtual object will be blurred next to the real object in focus. This leads to very uncomfortable side effects for the users, such as eye strain and nausea.

So how can this focusing function, which is so natural to us, be replicated using technology?

While many technologies are developing tweaks to bring depth in virtual images, such as rapidly moving the flat display based on eye-tracking, or stacking different displays at different distances, CREAL developed a technology that is fixing the issue at its core. Our goal is to recreate the light just like it exists in the real world, and therefore simulate the way in which light rays reach our eyes after reflecting off objects in our environment. To do so, we have developed a near-eye light-field display technology that simulates precisely the

three-dimensional perception that we experience in the real world. The true 3D perception is achieved by implementing light-field projectors in the temples of a pair of glasses, which bounce the light-field components on a holographic lens and back to the eye. Each light-field component enters the eye through slightly different perspectives (approximately 6000 per seconds) which, brought together, reconstruct the full virtual scene right in front of the user's eyes. This way, the virtual scene is built with genuine depth and is always in focus - it is up to the user to decide where to focus, just like in real life.

By recreating the light itself, CREAL enables the virtual objects to naturally fuse into reality, from arm's reach distance to infinity. Light-field technology provides users with AR experiences that are natural and comfortable to the human eyes.



## Current AR displays



## CREAL's light-field display







### Alex Kvasov CTO

8+ years in product development and technology commercialization in a start-up environment (ActLight, Technis).

### Tomas Sluka CEO

15+ years in high-profile research at CERN and EPFL. Early-stage technology commercialization. Highly cited author, invited speaker.

### Tomas Kubes Business Developer

Combining business and technical mind, IT and FinTech expert, managed IT resources at CERN and led two start-ups in (Sectors..). Double MSc in IT and economy.

### CREAL team

With dedicated engineers from Intel's smart glasses project as well as Magic Leap, CERN and EPFL, CREAL's expertise covers every aspect of the required technology, from optic and mechanic to electronic and software.

2018



2019



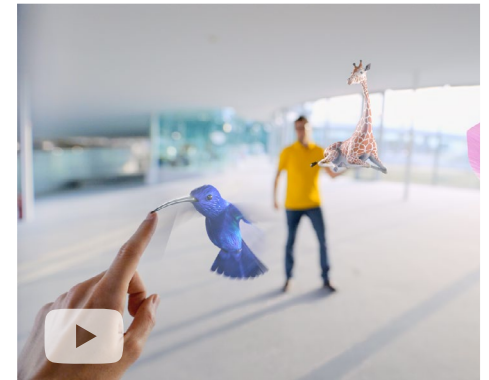
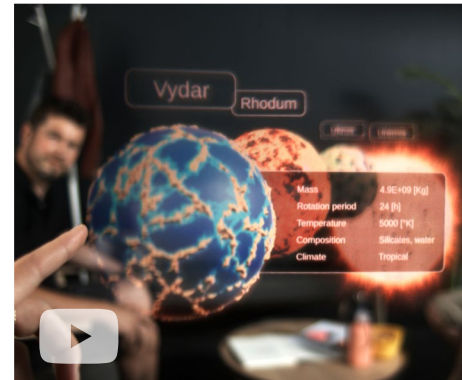
2020



2021



Early 2023







### AR displays need a revolution - Tomas Sluka's talk at SPIE AR VR MR 2022

09.04.2022



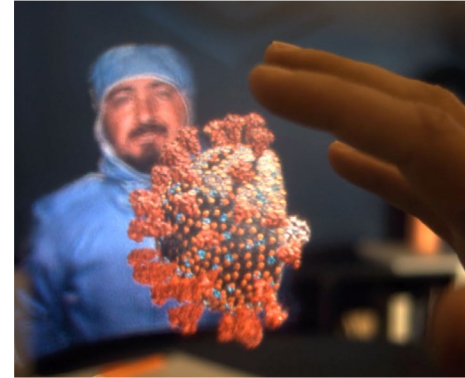
### TheMysticle visits CREAL

12.03.2022



### CREAL mentioned among the Swiss startups shaping the metaverse

05.01.2022



### CREAL and Imverse collaboration: making real-time collaboration possible

19.11.2021



### Antony Vitillo at CREAL

23.10.2021



