



## Press Release

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Mirrorcle Technologies Inc. and Sun Innovations, Inc. demonstrates focus-free MEMS micromirror head-up display application at SEMA 2011

Mirrorcle Technologies, Inc, a California-based manufacturer of patented, gimbal-less MEMS micromirror devices, and Sun Innovations, a provider of advanced super transparent imaging technology, today jointly announced that they cordially invite visitors of the SEMA show to their booth number 33263. The companies are showcasing state-of-the-art head-up displays (HUD), one of which is based on MTI's MEMS (Micro-Electro Mechanical Systems) technology, which enables low-power, small volume laser beam scanning systems. MTI's high-speed dual-axes MEMS mirror, in combination with a low-cost laser module and Sun's fully transparent, unlimited-angle specialty-foil is at the heart of this HUD technology.

### Head-up displays (HUD)

Head-up displays in cars allow representations of crucial information in the immediate field of view (FOV) of attentive drivers. This greatly increases the safety of operating a vehicle because the driver's eyes can remain on the road and do not have to divert to displays on or below the dashboard. HUD technology can convey standard information, such as speed, RPM, fuel level and turn signal indicators, potential hazards, low tire pressure warning, but it is particularly beneficial for display of relevant safety alerts, for enhanced-vision representations and directions from navigation systems.

The integration of a variety of sensors in the front and/or rear of a car allow for greatly increased safety features. For instance, infrared sensors can detect obstacles that may be invisible to the human eye due to fog or darkness. Collision sensors can warn drivers of imminent potential for accidents. HUDs can also be used to depict night vision images and a variety of other data.

### Laser-based, brightness-controlled display technology

A low-cost laser diode provides a beam that points at Mirrorcle Technologies' gimbal-less two-axis MEMS mirror. This scan module which includes lenses occupies only a few cubic centimeters and can be integrated into the dashboard or other smaller spaces as desired. A credit-card size controller board includes intelligent software which controls the precise movement of the mirror's X- and Y-axis, deflecting the laser beam onto the windshield where it is absorbed by Sun Innovations' display film. Namely, their super-transparent, water-clear fluorescent emissive projective display film allow for a clearly visible depiction of data on the windshield, both at night as well as during daylight. The lasers' brightness is adjustable and can be auto-controlled based on ambient lighting conditions. While the driver assumes a natural, comfortable driving position, she is able to gather valuable information right on the windshield, without significantly diverting his or her eyes away from the road.

The compact display unit is robust and requires very low power. Overall power consumption is typically less than 2.5W at maximum brightness, easily visible in daylight conditions. This is in part due to use of vector graphics which very efficiently utilize available laser power, rather than spreading this power over an image area such as with LCD, DLP, and similar projection technologies.

MTI MEMS technology also includes image projection type of devices with the capability to display real-time images in HD quality. With cameras placed on the front and rear of the vehicle, images can be displayed on the windshield in real-time, thereby greatly facilitating its maneuverability and improving driver security. Since MTI MEMS mirrors are a highly flexible and high-performance optical-scanning technology, they can also be used to precisely track objects in 3D space in



potential driver-to-computer input interface applications. Similarly they are perfect tools for laser-based collision-avoidance sensors and other long-range safety applications.

### **About Mirrorcle Technologies, Inc.**

Mirrorcle Technologies, Inc. (MTI), established in 2005, is a California corporation that commercially provides products and services based on its proprietary optical microelectromechanical system (MEMS) technology. As the result of successful research and development, MTI's products include the world's fastest large scan-angle two-axis scanning mirrors, as well as a series of resonating-type micromirror devices for MEMS-based display applications with VGA, SVGA, and HDTV capabilities. MTI is globally the only provider of tip-tilt MEMS actuators in combination with custom-size square or round mirrors from 0.8mm to several mm in diameter. The company offers R&D packages and off-the-shelf products with established designs. It also creates specialty designs and provides custom units for specific applications.

In addition to the clean-room laboratory at its corporate office, MTI has year-round, 24-7 access to wafer-based CMOS and MEMS fabrication facilities. In 2010, MTI established a manufacturing service cooperation with a leading wafer foundry that specializes in MEMS fabrication, allowing the ramp up of volume-production while maintaining highest quality standards. As a privately held company, MTI is able to act efficiently, it offers creative and highly responsive service to its customers and provides highest-quality products and personal technical support.

### **About Sun Innovations, Inc.**

Located in prime Silicon Valley region, Sun Innovations have dedicated long years in developing market persuasive product range with a global team of scholar PhDs. In the opening year of product deployment, Sun Innovations has more than 100 customers operating approximately 1,000 installations worldwide.

Sun Innovations also adds custom built MediaGlass™ and TransPlay™ Display technology with key customers in Media, Advertising, Entertainment, Aeronautic, Hospitality, Banking, Financial and Retail industries. MediaGlass products are employed to generate dynamic digital display portals with transparent, scalable, 2 side viewing angles and superior quality video projection systems available in 2 single color screens. The TransPlay product is designed to create massive, vibrant 3D, transparent, 2 side viewing angles with high quality UV single/dual color line art display solutions. Sun has also developed a complete array of emissive projection films.

The company has its Global Headquarters in Fremont, California, with two development branch offices in China employing more than 50 personnel worldwide. Sun Innovations's rapid distributorship growth has brought tremendous exposure not only in United States but also in the countries like Canada, United Kingdom, New Zealand, Australia, China, India, Japan and Taiwan.