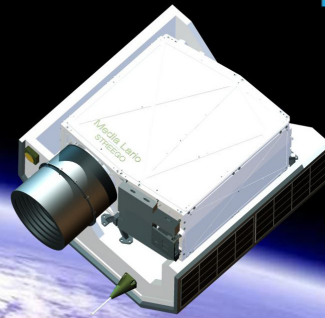


# HIGH PRECISION OPTICS AND OPTICAL SYSTEMS



Media Lario produces high specification optical components and systems for applications including Space and Terrestrial Astronomy, Satellite Earth Observation and Free Space Optical Communications. The company employs the patented Repli-formed Optics™ process which is a very high throughput and highly-replicable manufacturing method for high volume applications.

## OPTICAL SYSTEMS



### Hyperspectral Earth Observation Small Satellite Payloads

- 150 bands, 2.7 m resolution PAN, 5 m resolution RGB.
- Small satellite compatible at 20 kg mass using 20 W power budget.

### Laser Communication Terminal Optics

- Optical assemblies for free-space ground and satellite laser optical communication.
- Utilizing Media Lario's patented Repli-formed Optics™.

### X-ray Optics for Astronomy, EUVL and Scientific Applications

- Optical assemblies utilizing patented electroforming technology.
- Large range of coating materials and complex shapes.

## OPTICAL COMPONENTS



### High Precision Glass Mirrors, Lenses and Metallic Mirrors

- Shape accuracy better than 20 nm - aspheric, off-axis, freeform designs for UV, visible, IR.
- Size up to 1.2 m or larger.
- Glass, Quartz, ZERODUR™, Alum, Nickel coated Alum and Stainless Steel substrates.

### Repli-formed Optics™ - High Volume High Precision Optics

- Very high throughput and highly replicable, suitable for high volume cost sensitive applications.
- Available with light-weighting, optical pass-through, and other custom features.

## MIRRORED PANELS



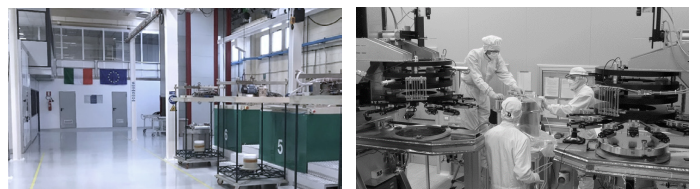
### Light-weight Metallic Panels

- Weight per area of 15 kg/m<sup>2</sup> for large segmented surface coverage.
- Shape accuracy better than 10 μm – spherical, aspheric, off-axis, freeform designs.
- Extended lifetime in harsh environments – life tested to 20 years.

### Light-weight Mirror Panels

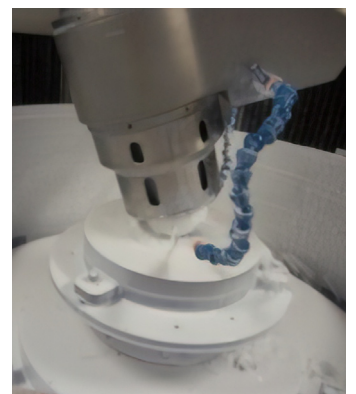
- Weight per area of 15 kg/m<sup>2</sup> for large segmented surface coverage.
- Shape accuracy better than 10 μm – spherical, aspheric, off-axis, freeform designs.
- Surface materials include coated thin glass, coated polymers and other materials.

## CUSTOM CAPABILITIES



### Customized Optics

- Diverse processes - electroforming, deterministic polishing and figuring, hot and cold shaping.
- Large scale on-site metrological capabilities for dimension, shape, and surface quality.
- High-volume factory with over 1000 m<sup>2</sup> ISO 5/6 cleanroom for assembly and integration.



## ASTRONOMY



### Space Telescopes

- Design and manufacturing of light-weight, uniquely shaped mirrors with demanding optical performance for Space Telescopes.
- Our experience in Space Telescopes spans 3 decades, including ATHENA (ESA), Einstein Probe (CAS/ESA), eROSITA (MPE), XMM-Newton (ESA), JET-X / SWIFT (NASA), Beppo SAX (ASI).

### Large Terrestrial Telescopes

- Light-weight glass and metallic mirrored panels.
- Typical shape accuracy required is within 10  $\mu\text{m}$  over a 2  $\text{m}^2$  surface.
- Our experience in large terrestrial telescopes includes Large Millimeter Telescope (LMT- INAOE) and ALMA Telescope Array (ESO) used to make first image of a Black Hole.

## FREE SPACE OPTICAL COMMUNICATIONS



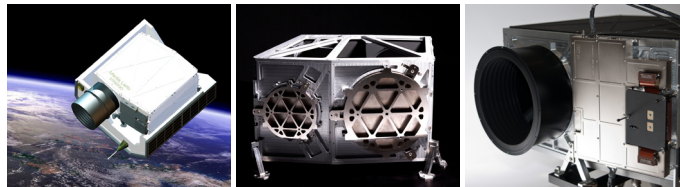
- Manufacturing of a host of products for Free Space Optical Communications from individual optical elements to full optical systems.
- Ideally suited for GB to TB communications speeds and above.
- Media Lario uses its patented Repli-formed Optics™ process to achieve high throughput manufacturing and target costs.

## SPACE FLIGHT HERITAGE

### Over 25 years Experience of High Precision Optics in Space

- Media Lario optics have been utilized in space borne programs since company founding.
- Large scale X-ray telescopes including eROSITA, XMM-Newton, JET-X/SWIFT, Beppo-SAX.
- Ongoing programs include ATHENA, CHEOPS, PLATO, FLEX, JUICE, Einstein Probe, eXTP.

## EARTH OBSERVATION



- Media Lario designs and manufactures optical systems for Earth Observation.
- High resolution visible spectrum (RGB) optical systems as well as multi-spectral, hyper-spectral and IR systems.
- **STREGO**: hyper-spectral payload for small satellites comprised of a Three Mirror Anastigmat (TMA) unobscured optical system for high performance imaging. The payload is 20 kg in mass and runs at 20 W power consumption.
- Expertise in specification, design, integration, testing and dependability.
- Consolidated competencies in space compatibility and thermal management.

## FLIGHT SIMULATORS



- Media Lario has developed light-weight mirrored screens for full sized civilian and military flight simulators.
- Weight of the screen assembly can be reduced up to 50-70%, significantly reducing the cost of operating a full flight simulator.
- Easier assembly and integration of the simulator at customer site due to lower weight, less brittleness.

## ABOUT MEDIA LARIO



Media Lario S.r.l. is a dynamic and innovative technology-driven company supplying advanced optical components and optical systems. The company works with agency partners such as ESA and NASA and leading aerospace companies.

The company is located in the industrial hub of Milan, Italy, and very near to picturesque Lake Como surrounded by the Italian Alps.



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