

What the DCL Offers

Detector Array and System Characterization

The DCL offers full optical and electrical characterization of focal plane systems, detector arrays, and supporting electronics.

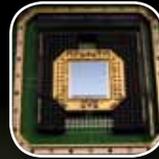


Detector Array and System Development

Use the DCL's experienced and knowledgeable staff throughout the new product development lifecycle, from concept formulation and design, prototyping and qualification, through launch and post-launch support.

Radiation Effects Testing and Analysis

Radiation testing and analysis of detector arrays for spaceflight qualification can be performed in cooperation with Goddard's Radiation Effects and Analysis Group.



Optical and Electrical Characterization

The DCL has a suite of characterization capabilities in one facility that allows complete optical and electrical testing of large-format detector arrays.



Flight Qualification Testing

The DCL supports flight qualification testing including radiation, thermal vacuum, vibration, acoustic, and EMI/EMC testing of detectors and detector systems.



Contact Information

For process flow approval and scheduling contact:

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Detector Systems Branch
NASA's Goddard Space Flight Center
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To set up a Space Act Agreement with NASA's Goddard Space Flight Center, contact:

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<http://detectors.gsfc.nasa.gov/DCL>

National Aeronautics and Space Administration



How to Work With the Detector Characterization Laboratory at NASA's Goddard Space Flight Center

Complete optical and electrical characterization of large-format detector arrays operating in the ultraviolet, visible, and infrared spectrums



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About the Detector Characterization Laboratory

The Detector Characterization Laboratory (DCL), located at NASA's Goddard Space Flight Center in Greenbelt, Maryland, is a testing facility for the complete optical and electrical characterization of large-format detector arrays operating in the ultraviolet, visible, and infrared spectrums.

The facility consists of several laboratories, including class 100 and 10,000 clean rooms for testing contamination-sensitive detectors and subsystems. NASA is looking for partnerships with United States companies, universities, and other government agencies that are developing radiation detectors and systems.

Characterization Capabilities

The DCL's extensive experience and expertise in characterizing advanced detector arrays and systems can be leveraged from the design phase and through the entire product development lifecycle.

Device Characterization

Standard Characterization Tests

- Readout, CDS, and total noise
- Dark current
- Relative and absolute quantum efficiency
- Conversion and electronic gain
- Flat-field optical illumination and spot scans (for intra pixel sensitivity)
- Spatial resolution and MTF (including PSF and low-level halo)
- CCD charge transfer efficiency using ^{55}Fe (radioactive isotope) and other techniques

- Crosstalk and inter-pixel capacitance
- Linearity and well depth
- Image persistence
- Stability of detector characteristics
- General-purpose reconfigurable detector array control and data acquisition electronics including timing pattern generation and optimization
- Ultra-low background testing in the infrared with specially built and instrumented test cryostats
- Extensive data analysis capabilities
- Flight qualification testing

Development of Focal Plane Systems, Detector Arrays, and Electronics

Detector Fabrication

Personnel in the DCL can help develop detector systems from the design phase through the entire new product development lifecycle.

Goddard's Detector Systems Branch also includes the Detector Development Laboratory (<http://detectors.gsfc.nasa.gov/DDL>). This MEMS and nanotechnology fabrication facility can be used by U.S. companies, universities, and other government agencies for prototyping and developing semiconductor devices such as focal plane arrays and other radiation detectors.

Radiation Testing of Detector Arrays with Goddard's Radiation Effects and Analysis Group (REAG)

The REAG performs testing and analysis investigating the effects of radiation on electronics and photonics.

Find out more about REAG at:

<http://radhome.gsfc.nasa.gov/top.htm>

<http://detectors.gsfc.nasa.gov/DCL>

Working with Goddard's DCL

The Process

In order to investigate opportunities for collaboration, a company's technical personnel must first work with the DCL's engineering team to outline specific testing requirements based on a statement of work (SOW). The earlier in the design or development stage that the DCL staff is engaged, the easier and possibly faster the characterization can be performed. The DCL technical staff will perform all equipment setup and measurements, although the company's personnel are allowed to be onsite during such times.

NASA uses a Space Act Agreement (SAA) to work with outside companies or organizations, which must be negotiated and set up prior to any work being performed.

How to Get Started

1. Contact Brent Mott to discuss scope, technical feasibility, and the schedule for your project then develop a SOW.
2. Work with Ted Mecum in Goddard's Innovative Partnerships Program Office to set up an SAA, encompassing the details (billing, facility access, etc.) that will allow work to start.
3. Kick off the program with an onsite meeting between the company and the DCL engineering staff.

Time and Scheduling Guidelines

The time needed to characterize a detector array or system depends on the complexity of both the device and the tests being performed. Many times, the characterization equipment needs to be reconfigured or developed to test a specific device. This set up time could take several weeks if additional hardware needs to be procured.