Multifunction Imaging and Spectroscopic Instrument
There would be no repositioning for different observations of the same specimen.

NASA's Jet Propulsion Laboratory, Pasadena, California

A proposed optoelectronic instrument would perform several different spectroscopic and imaging functions that, heretofore, have been performed by separate instruments. The functions would be reflectance, fluorescence, and Raman spectrosopies; variable-color confocal imaging at two different resolutions; and wide-field color imaging.

The instrument was conceived for use in examination of minerals on remote planets. It could also be used on Earth to characterize material specimens. The conceptual design of the instrument emphasizes compactness and economy, to be achieved largely through sharing of components among subsystems that perform different imaging and spectrometric functions. The input optics for the various functions would be mounted in a single optical head. With the exception of a targeting lens, the input optics would all be aimed at the same spot on a specimen, thereby both (1) eliminating the need to reposition the specimen to perform different imaging and/or spectroscopic observations and (2) ensuring that data from such observations can be correlated with respect to known positions on the specimen.

The figure schematically depicts the principal components and subsystems of the instrument. The targeting lens would incorporate multiple subsystems that would share optical components.
Improved Measurement of Dispersion in an Optical Fiber
The lower limit of measurability is extended.
NASA’s Jet Propulsion Laboratory, Pasadena, California

An improved method of measuring chromatic dispersion in an optical fiber or other device affords a lower (relative to prior such methods) limit of measurable dispersion. This method is a modified version of the amplitude-modulation (AM) method, which is one of the prior methods. In comparison with the other prior methods, the AM method is less complex. However, the AM method is limited to dispersion levels $\geq 160$ ps/nm and cannot be used to measure the symbol of the dispersion. In contrast, the present modified version of the AM method can be used to measure the symbol of the dispersion.