BILLING CODE 3510-DS-P

DEPARTMENT OF COMMERCE

International Trade Administration

Ohio State University, et al.;

Notice of Decision on Application

for Duty-Free Entry of Scientific Instruments

This is a decision pursuant to Section 6(c) of the Educational, Scientific, and Cultural Materials Importation Act of 1966 (Pub. L. 89-651, as amended by Pub. L. 106-36; 80 Stat. 897; 15 CFR part 301). Related records can be viewed between 8:30 A.M. and 5:00 P.M. in Room 3720, U.S. Department of Commerce, 14th and Constitution Ave, NW, Washington, D.C.

Docket Number: 14-009. Applicant: Ohio State University, Columbus, OH 43210. Instrument: Diode pumped, solid state high speed Nd:YVO4 laser system. Manufacturer: Edgewave GmbH, Germany. Intended Use: See notice at 79 FR 34491, June 17, 2014. Comments: None received. Decision: Approved. We know of no instruments of equivalent scientific value to the foreign instruments

described below, for such purposes as this is intended to be used, that was being manufactured in the United States at the time of order. Reasons: The instrument will be used to conduct particle imaging velocimetry, and Rayleigh scattering and planar laser-induced fluorescence, to understand the fundamental roles of fluid turbulence on scalar mixing and reaction rates by studying fundamental fluid mechanics and chemical kinetics in turbulent flows with and without chemical reaction and combustion. The primary targets are non-reacting turbulent flows consisting of compressed air and combusting turbulent flows with fuels of methane and oxidizer of air. The products of combustion are water, carbon dioxide, and nitrogen. The instrument is required to operate over a broad range of experiment conditions with specific targets of repetition rates ranging from 1 to 50 kHz. At these repetition rates, a minimum output power of 20 Watts is required at all operating conditions. A high-quality beam profile of $M^2<2$ is also needed. The pulse duration of the laser must also be less than 10 nanoseconds. Without these characteristics, accurate velocity and scalar fields, including species concentration, temperature, and density cannot be measured.

Docket Number: 14-011. Applicant: University of California, San Diego, La Jolla, CA 92093. Instrument: iMIC Digital Microscope 2.0. Manufacturer: TILL Photonics (FEI Munich), Germany. Intended Use: See notice at 79 FR 41537, July 16, 2014. Comments: None received. Decision: Approved. We know of no instruments of equivalent scientific value to the foreign instruments described below, for such purposes as this is intended to be used, that was being manufactured in the United States at the time of order. Reasons: The instrument will be used to gain fundamental knowledge of the mechanisms involved in eukaryotic cell motion, by utilizing a total internal reflection technique which allows visualization of only the cell part that is immediately above the substratum (roughly the bottom 100nm of a cell), which enables cell imaging with a superior spatial and temporal resolution over other non-TIRF microscopes. Examples of experiments to be conducted with the instrument include measuring the forces generated by several different cell types on substrates during directed motility, determining the spatial location of signaling components involved in cell-substrate adhesion, investigating the effect of different substrate rigidities on cell motility, determining the response of

cells to externally imposed chemical gradients, and determining the role of certain signaling components in cell motility. Crucial in the experiments is the unique ability of the instrument to autofocus the imaging plane such that the cell remains in focus for an extended period of time, which guarantees sharp images for the duration of the experiments. The instrument also has a Yanus IV scanhead that enables fast Fluorescence Recovery After Photobleaching (FRAP) experiments, and a custom-made plexiglass box to facilitate specific temperature and CO2 concentrations required by mammalian and amoeboid cells, that can easily be removed to transition between different conditions.

Docket Number: 14-013. Applicant: Howard Hughes Medical University, Chevy Chase, MD 20815. Instrument: Vitrobot Vitrification Robot for Cryopreservation. Manufacturer: FEI, Czech Republic. Intended Use: See notice at 79 FR 46773, August 11, 2014. Comments: None received. Decision: Approved. We know of no instruments of equivalent scientific value to the foreign instruments described below, for such purposes as this is intended to be used, that was being manufactured in the United States

at the time of order. Reasons: The instrument is used to produce high-quality frozen-hydrated biological specimens for observation in cryo-TEM, to determine the structure of macromolecular biological complexes. It is equipped with an environmental chamber and fully automated control of blotting and plunge-freezing conditions. The computerized control of the humidity/temperature environment specimen chamber and blotting/freezing conditions is essential to reproducibly obtaining high quality samples for TEM, free of freezing artifacts.

Docket Number: 14-015. Applicant: South Dakota State University, Brookings, SD 57007. Instrument: SUNALE R-150 Atomic Layer Deposition Reactor. Manufacturer: Picosun, Finland. Intended Use: See notice at 79 FR 46773, August 11, 2014. Comments: None received. Decision: Approved. We know of no instruments of equivalent scientific value to the foreign instruments described below, for such purposes as this is intended to be used, that was being manufactured in the United States at the time of order. Reasons: The instrument will be used to obtain ultrathin dielectric films with full coverage of semiconductor device surface to prevent

electric leakage, and fabricate amorphous metal thin films, by depositing oxide films onto metal layer surfaces and studying the effect of the diode, in order to study film uniformity, adhesion, dielectric constant, and optical constants. Unique features of the instrument include a dual vacuum chamber, which allows different reaction chambers to be fit into the same vacuum chamber, allowing easy scale up to batch process and deposition on different substrates, source lines that are pre-heated before entering the reactor chamber, improving the deposition quality, and the option of ultra-high vacuum system by using metal seal flanges. Another unique feature is the hot-wall reaction chamber, which allows a metal-metal sealing surface and pressure control that keeps all process gases inside the reaction chamber with no condensation occurring in the vacuum chamber walls. The reaction chamber walls are at the same temperature as the substrate which prevents secondary reaction routes inside the reaction chamber that would result in the loss of self-limited growth mechanism of ALD, ensures no corrosion occurs on the vacuum chamber walls, and ensures the best particle performance and long maintenance cycles, and a maximum deposition temperature of 500 degrees Celsius.

Docket Number: 14-016. Applicant: California Institute of Technology, Pasadena, CA 91125. Instrument: iXBlue OCTANS Surface-Fiber Optic Gryocompass. Manufacturer: iXBLUE Incorporated, France. Intended Use: See notice at 79 FR 41537, July 16, 2014. Comments: None received. Decision: Approved. We know of no instruments of equivalent scientific value to the foreign instruments described below, for such purposes as this is intended to be used, that was being manufactured in the United States at the time of order. Reasons: The instrument will be used to provide accurate data for research on earthquake early warning, by orienting more than 100 seismic sensors to the exact north direction. The instrument includes unique features such as compact design and ease of use in enclosed spaces such as small vault installations that are 8 feet deep and only 2 feet in diameter, the ability to measure orientation with an accuracy of 0.1 degrees, portability, and is based on iXBlue's proprietary algorithms that are not available domestically.

Docket Number: 14-019. Applicant: New Mexico Institute of Mining and Technology, Socorro, NM 87801. Instrument:

Tip-Tilt/Narrow-field Acquisition System (FTT/NSA). Manufacturer: University of Cambridge-Cavendish Labs, United Kingdom. Intended Use: See notice at 79 FR 46773, August 11, 2014. Comments: None received. Decision: Approved. We know of no instruments of equivalent scientific value to the foreign instruments described below, for such purposes as this is intended to be used, that was being manufactured in the United States at the time of order. Reasons: The instrument will be used to acquire the astronomical target by sensing its location in a moderate field of view image and using the position of the target relative to a pre-determined location in the sensor field of view to provide signals used to adjust the pointing of the telescope, and thereafter to detect and eliminate rapid tip-tilt (i.e. angle of arrival) fluctuations in the incoming light beam due to atmospheric turbulence – sensing these again by measuring the position of the target relative to a pre-determined location in the sensor field and using these measurements to send high frequency control signals to the active secondary mirror of the telescope and low frequency pointing corrections to the telescope mount. The unique features of the instrument are the interferometer system which is designed to fulfill the

Science Reference Mission, including a focus on model-independent imaging as opposed to astrometric or precision phase or visibility measurement, which implies the ability to relocate the telescope, in particular the provision of a close-packed array configuration with shortest inter-telescope separations of 7.8 m. Another unique feature is the ability to reach limiting magnitudes of H=14 for group delay fringe tracking and V = 16 for tip-tilt sensing to allow observations of extragalactic targets (in particular AGN, which have red colors). Other unique features include a dual role as a tip-tilt (angle of arrival) correction system and target acquisition system, for which a 60" field of view is required, a level of opto-mechanical stability such that the change in the effective tip-tilt zero point is less than 0.015" on the sky for a 5 degree Celsius change in ambient temperature, which implies sub-micron stability of the components of the system over the course of a night, a limiting sensitivity of 16^{th} magnitude at visual wavelengths (limiting magnitude V = 16 for target acquisition and residual tilt in fast tip-tilt mode < 0.060" at V = 16), and the ability to maintain the surface temperature of FTT/MSA components close to the light beam path within 2 degrees Celsius of ambient, which, coupled

with the wide operating temperature range, requires the camera to be housed in a special environmentally-controlled enclosure.

Dated: September 15, 2014.

Gregory W. Campbell,
Director,
Subsidies Enforcement Office,
Enforcement and Compliance.

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