Memorandum of Understanding (MOU)

Between

UChicago Argonne, LLC, Operator of Argonne National Laboratory

and

University de Technology at Troyes, France

UChicago Argonne, LLC, operator of the Argonne National Laboratory (Argonne) and the University of Technology at Troyes (UTT), collectively the "Participants",

SHARING an interest in collaborating to advance nanophotonics technologies, including synthesis, self-assembly, nanocharacterization and theory through Argonne's Center for Nanoscale Materials (CNM) and UTT's Laboratory for Nanoscale Instrumentation and Optics (LNIO)

HAVE REACHED THE FOLLOWING UNDERSTANDING:

I. OBJECTIVE

The Participants intend to work together to develop the mechanisms and processes that will promote and sustain collaborative efforts for research and development (R&D) in the topic areas described below.

II. AREAS OF COOPERATION

Topics of the Participants' proposed collaboration may include, but are not limited to, polymer and surfactant chemistry for efficient generation of nanoscale heterostructures; nanoscale lithography; and combined expertise in ultrafast spectroscopy and near-field optics.

Examples of particular interest for new joint proposals are: incorporation of liquid crystals into the polymer to create nanoscale polymer dispersed liquid crystals (PDLCs); incorporation of molecules with non-linear properties into the nanoscale polymer; incorporation of semiconductor quantum dots into the polymer to produce near-field enhanced emission of quantum dots; characterization of nanoscale plasmonic behavior; and characterization of new ultrafast pathways for dissipation and propagation of absorbed optical energy.

Other areas of collaboration may be added by the Participants' mutual consent in writing.

III. FORMS OF COOPERATION

Cooperation may include, but is not limited to:

1. Exchange of information, publications, reports, technical data, samples, and materials;

- 2. Exchange of scientists, engineers, other specialists, and PhD students associated with the Sciences et Technologies UTT PhD school for participation in training, project definition activities, and R&D planning. Each Participant is to abide by the health, safety, and environmental requirements of the host Participant when on an exchange assignment at the host Participant's facility;
- Planning of joint research projects in the Areas of Cooperation cited in Section II, such R&D to be undertaken pursuant to the established User Agreement between the Participants.

IV. MECHANISMS OF COOPERATION

Each Participant should designate one or more Lead Coordinators, to serve as its principal representative(s) for all activities conducted under this MOU, including identifying areas of cooperation, providing rapid response concerning its organization's interest in specific areas of cooperation, coordinating cooperation between the Participants, and identifying available resources (including funding) for collaborative activities under this MOU.

V. GENERAL PROVISIONS

- 1. This MOU does not create any legally binding obligations between the Participants.
- 2. The conduct of cooperative activities contemplated by this MOU is subject to the availability of funding, personnel, and other resources.
- 3. Each Participant should conduct the cooperation under this MOU in accordance with applicable laws and regulations to which it is subject, and international agreements to which its Government is party.
- 4. Each Participant is responsible for the costs it incurs in participating in cooperative activities under this MOU.

VI. COMMENCEMENT, MODIFICATION AND DISCONTINUATION

- Cooperative activities under this MOU may commence upon signature by the Participants and continue for a 5-year period unless discontinued in accordance with paragraph 2 of this Section VI.
- 2. The Participants may discontinue this MOU at any time in writing. A Participant that wishes to discontinue its participation in this MOU should endeavor to provide at least ninety (90) days written notice to the other Participants.
- 3. This MOU may be modified in writing by mutual consent of the Participants, and may be cxtended for additional periods.

UChicago Argonne, LLC **Operator of Argonne National Laboratory**

Eric D. Isaacs Director, Argonne National Laboratory

4/12/2012 Date

University de Technology at Troyes, France

Christian Lerminiaux President, University of Technology at Troyes

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05.12.2012 Date