LIP 2012

LASERS AND INTERACTIONS WITH PARTICLES
Optical Particle Characterization follow-up.

2012, march 26-30th
INSA de Rouen, CORIA UMR 6614, Rouen, France.

Program

Sunday, march 25th, 2012

18:00 to 22:00 — *Welcome Reception & Registration*
(Tourism Office of Rouen, in front of the Cathedral)

Monday, march 26th, 2012

08:30 — *Reception & Registration in the INSA of Rouen*
Conference site

10:00 — Welcome Address of LIP 2012, (Opening Ceremony) in the presence of :
Alain Le Vern, Président of the regional council of « Haute Normandie »
J.L. Billoët, Directeur of the INSA of Rouen
Cafer Ozkül, Président of the Université of Rouen
M.A. Boukhalfa, Directeur of the CORIA – UMR 6614

10:30 — Keynote lecture
J.A. Lock, Cleveland University, USA.
Novel results for scattering of a focused Neuman beam by a sphere.

Session 1: Fundamentals
Chaimens: G.Gréhan & D. Hirleman

11:30 — Beam shape coefficients of the most general focused Gaussian laser beam for GLMT calculations.
J.A. Lock, Cleveland State University, USA.

11:55 — Gaussian beam scattering by small particles of arbitrary shape and structure.
Y.P. Han and Z.W.Cui, Xidian University, China.

12:20 — Approximations in the scattering from cylinders near a planar dielectric interface.
P. Pawliuk and M. Yedlin, University of British Columbia, Vancouver, Canada.

12:45 — Internal and near-surface field distributions for a spheroidal particle illuminated by a focused Gaussian beam in an on-axis case.
L. Han and Y.P. Han, Xidian University, China.

13 :15 — *Lunch*

Session 2: Near-fields and internal fields.
Chaimens: Y.P.Han & J.A.Lock

14:30 Control of optical resonances in dielectric spheres using Laguerre-Gaussian beams.
X. Zambrana-Puyalto and G. Molina-Terriza, Macquarie University, Australia.

14:55 Photonic jets from spherical micron-sized particles under resonant excitation of internal optical field.
Y.E. Geints et al., Zuev Institute of Atmospheric Optics, Tomsk, Russia.

15:20 Lorenz-Mie theory for designing systems for detecting and characterizing small particles : photonic jets and nano-antennas.
B. Stout et al., Institut Fresnel, Marseille, France.

15:45 Mie scattering field inside and near a coated sphere :
computation and biomedical applications.
H. Suzuki and I-Yin Sandy Lee, University of Toyama, Japan.

16:10 *coffee break*

Session 3: Mechanical effects of light.
Chaimens: F.Lemoine & B.Pouligny

16:30 Changing the refractive index in optical trapping : from positive to negative.
I.A. Ambrosio and H.E. Hernadez-Figueroa, University of Campinas, Brazil.

16:55 Analysis of radiation pressure force exerted on a biological cell using Debye series.
R. Li et al., Xidian University, China and University of Rouen, France.

19:00 *Welcome reception*
20:30 *Dinner for Honorary chair, Scientific et Advisory committees.*

Tuesday, march 27th, 2012

09:00 Keynote lecture

B. Pouligny, CNRS, Centre Paul Pascal, Pessac, France.
Optical levitation and long-working distance trapping : from spherical up to high aspect ratio ellipsoidal particles.

Session 3: Mechanical effects of light. (continued)

10:00 Optical forces size-effect in Bessel beam type optical vortices.
M. Siler et al., Institute of Scientific Instruments of the ASCR, Brno, Czech Republic.

10:25 Advanced optical micromanipulations in structured dual beam trap.
O. Brzobohaty et al., Institute of Scientific Instruments of the ASCR, Brno, Czech Republic and University of St Andrews, Scotland.

10:50 *Coffee break*

11:20 Combining weighting and scatterometry :
application to a levitated droplet of suspension.
D. Jakubczyk et al.
Institute of Physics of the Polish Academy of Science, Warsaw, Poland.

11:45 Optically trapped anisotropic particles as sensitive force probes.
S.H. Simpson and S. Hanna, University of Bristol, UK.

12:10 *Lunch*

Session 4 : Optical particle characterization (large particles)
Chaimens: W.Bachalo & A.Taylor

13:45 Numerical evaluation of the optical connectivity technique for breakup length measurements of liquid columns.
G. Charalampous and Y.Hardalupas, Imperial College, London, UK.

14:10 Detection of airborne particles in industrial environments using LIBS (Laser-Induced Breakdown Spectroscopy).
C. Dutouquet et al., INERIS, Verneuil en Halatte, CEA Saclay, CTIF Sevres, France.

14:35 Rapid microbe colony identification by optical scattering.
J.P. Robinson et al., Purdue University and University of California, Merced.

15:00 Technique to determine particle velocity and size immediately before impacting perpendicularly on a solid surface.
N. Roth and B. Weigand,
Institute of Aerospace Thermodynamics, University of Stuttgart, Germany.

15:25 Aerosol composition analysis by single-particle differential scattering based absorption spectroscopy.
B.G. Saar et al.
MIT Lincoln University, Lexington, and Naval Reach Laboratory, Washington, USA.

16:00 *Garden party : Departure for « la ferme de Bray»*

19:00 *Norman village meal*

Wednesday, march 28th, 2012

09 :00 Keynote lecture

W. Bachalo, Artium Technologies, Inc., USA
Light scattering interferometry : invention, development, and application.

Session 4 : Optical particle characterization (large particles) (continued)
Chairmens : Y.Hardalupas & N.Roth

10:00 The time-shift technique for measurement of size and velocity of particles.
W. Schäfer and C. Tropea, University of Darmstadt, Germany.

10:25 Droplet sizing errors in interferometric spray measurement techniques.
K. Zarogoulidis et al., Imperial College, London, UK.

10:50 Coffee break

11:15 Determination of dust properties using the negative polarization phenomenon.
E. Zubko et al., University of Helsinki, Finland,
Kharkov National University, Ukraine, Russia & Finnish Geodetic Institute, Finland.

11:40 Particle sizing in highly turbid dispersions with photon density wave spectroscopy.
L. Bressel & al., University of Potsdam, Germany.

12:05 *Lunch*

Session 5. Refractometry, Imaging and holography.
Chaimens: M.Brunel & Haitao Yu

13:30 Spheroidal droplet measurements based on generalized rainbow patterns.
H.Yu et al., Technische University of Darmstadt, Germany &
California Institute of Technology, Pasadena, USA.

13:55 Characterization of the thermo-chemical properties of spray by global rainbow refractometry.
S. Saengkaew et al., CORIA – UMR 6614, CNRS-Université & INSA de Rouen, France.

14:20 Phase contrast metrology using digital in line holography : reconstruction of phase discontinuities.
M. Brunel et al.
CORIA – UMR 6614, CNRS-Université & INSA de Rouen &
ENSICAEN, Université de Caen, France.

14:45 Glare point metrology of droplets using digital holography reconstruction techniques.
H. Shen et al., CORIA – UMR 6614, CNRS-Université & INSA de Rouen, France.

15:10 Digital off-axis and Gabor in-line holographic microscopy with shaped beams : a numerical investigation.
X. Wu et al.
Zhejiang University, China & CORIA – UMR 6614, CNRS-Université & INSA de Rouen, France.

15:35 *Coffee break*

Session 6 : Nanoparticles and Brownian motion.
Chaimens: X.Cai, H.Fujimoto

16:00 In-situ measurement of aerosol particle temperature with photon correlation spectroscopy.
M. Itoh et al., Doshisha University, Kyoto, Japan.

16:25 A novel dynamic light scattering method for nanoparticle sizing.
X. Cai et al., University of Shanghai for Sciences and Technology, China.

16:50 Collective complex structure of fine particles due to hydrodynamic interaction evaluated by photon-correlation spectrum method.
H. Takano et al., Doshisha University, Kyoto, Japan.

17:15 Proposal study on a Fourier-domain low-coherence dynamic light scattering technique and its application to analysis of the wall-drag effect.
T. Watarai et T. Iwai. Tokyo University, Japan.

17:40 Detection of Brownian particles motion and a proposal to the application of Fourier Interferometric Imaging technique to the characterization of nanoparticles suspensions in liquid.
P. Briard et al., CORIA – UMR 6614, CNRS-Université & INSA de Rouen, France.

19:00 *Guided tour of the medieval downtown*

Thursday, march 29th, 2012

08:30 **Keynote lecture**

T. Wriedt, Bremen University, Germany.
Shaped laser beam light scattering by complex particles using the T-matrix method.

Session 7: Nanoparticles and aggregates.
Chaimens: T.Wriedt & P.Zemanek

09:30 Optical characterization of the interaction of diamond nanoparticles with blood components and consequences for blood rheology.
A.V.Priezzhev et al.,
Lomonosov Moscow State University, Russia - National Dong Hwa University, Taiwan - Russian Academy of Science, Russia and Tzu-Chi University, Taiwan.

09:55 Optical characterization of highly ordered aggregates of colloidal nanobeads.
S.Barbosa et al., IUSTI, University of Provence & IRFM, CEA Cadarache, France.

10:20 Theoretical and experimental study of light depolarization by nanoparticle fractal aggregates.
A.Bescond et al., CORIA – UMR 6614, CNRS-Université & INSA de Rouen, France.

10:45 Measurement of the soot size distribution in flames by inversion of angular light scattering.
C. Caumont-Prim. et al., CORIA – UMR 6614, CNRS-Université & INSA de Rouen, France.

11:10 Coffee break

11:30 Development of the multi wavelength light extinction technique for size and concentration measurements of nanoparticles.
I.T.Horvath and M.R.Vetrano, Von Karman Institute for Fluid Dynamics, Rhode-Saint-Genèse, Belgique.

11:55 Electromagnetic scattering by aggregates of spherical particles : circular-polarization ratio
A.Virkki and K. Muinonen.
University of Helsinki and Finnish Geodetic Institute, Finland.

12:20 Geometric characterization of gold nanoparticle ensembles based on scatterometry.
N. Xu et al. , Tsinghua University, China.

12:45 *Lunch*
14:00 *Departure for tourism program*
20:00 *Conference social dinner*

Friday, march 30th, 2012.

09:00 Keynote lecture
G. Gouesbet, CORIA – UMR 6614, INSA de Rouen, France.
A scientific and sociological story of generalized Lorenz-Mie theories.

Session 8: Miscellaneous including multiple scattering.
Chaimens: L.Méès & F.Xu

10:00 On a physical-optics approximation of the near-critical-angle scattering of 2D spheroid bubbles.
F.R.A. Onofri et al., IUSTI, CNRS et Aix-Marseille University, France & Bulgarian Academy of Sciences, Sofia, Bulgaria.

10 :25 Multiple scattering factor of highly concentrated aerosol particle in laser beam propagation with wide-range collecting angle.
H. Takano et al., Doshisha University, Japan.

10:50 Coffee break

11:15 A Markov chain framework for polarized radiative transfer computations and aerosol/surface retrievals.
F. Xu et al. , California Institute of Technology, Pa-sadena, USA.

11:40 Coherent backscattering in solar-system regoliths.
K. Muinonen, University of Helsinki and Finnish Geodetic Institute, Finland.

12:05 Interpreting the far-field scattering pattern of a homogeneous sphere in q-space.
R.K. Chakrabarty et al., Desert Research Institute, Reno, USA.

12:30 *Lunch*

14:00 *End of LIP 2012*