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Hiroyuki Shiraga
Takeharu Goji Etoh
Editors

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## Contents

vii  **Authors**  

xi  **Conference Committees**  

xvii  **Introduction**  

xxi  **Awards**  

xxiii  **Exhibitors**  

### IMAGE SENSORS AND APPLICATIONS

<table>
<thead>
<tr>
<th>Paper ID</th>
<th>Title</th>
<th>Page</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>10328 02</td>
<td>A high sensitivity 20Mfps CMOS image sensor with readout speed of 1Tpixel/sec for visualization of ultra-high speed phenomena</td>
<td>10328-59</td>
<td></td>
</tr>
<tr>
<td>10328 03</td>
<td>A 20 Mfps high frame-depth CMOS burst-mode imager with low power in-pixel NMOS-only passive amplifier</td>
<td>10328-65</td>
<td></td>
</tr>
<tr>
<td>10328 04</td>
<td>A 3D stacked global-shutter image sensor with pixel-level interconnection technology for high-speed image capturing</td>
<td>10328-19</td>
<td></td>
</tr>
<tr>
<td>10328 05</td>
<td>AGIPD: a multi megapixel, multi megahertz x-ray camera for the European XFEL</td>
<td>10328-22</td>
<td></td>
</tr>
<tr>
<td>10328 06</td>
<td>A time-of-flight range image sensor using high-speed 4-tap lock-in pixels</td>
<td>10328-53</td>
<td></td>
</tr>
<tr>
<td>10328 07</td>
<td>Pixel parallel localized driver design for a 128×256 pixel array 3D 1Gfps image sensor</td>
<td>10328-10</td>
<td></td>
</tr>
<tr>
<td>10328 08</td>
<td>Crosstalk in multi-collection-gate image sensors and its improvement</td>
<td>10328-24</td>
<td></td>
</tr>
<tr>
<td>10328 09</td>
<td>A fast double shutter for CCD-based metrology</td>
<td>10328-21</td>
<td></td>
</tr>
<tr>
<td>10328 0A</td>
<td>High-speed imaging using CMOS image sensor with quasi pixel-wise exposure</td>
<td>10328-47</td>
<td></td>
</tr>
</tbody>
</table>

### LASERS AND APPLICATIONS

<table>
<thead>
<tr>
<th>Paper ID</th>
<th>Title</th>
<th>Page</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>10328 0B</td>
<td>Probing attosecond dynamics of molecules by an intense a-few-pulse attosecond pulse train</td>
<td>10328-13</td>
<td></td>
</tr>
<tr>
<td>10328 0C</td>
<td>All-optical framing photography based on hyperspectral imaging method</td>
<td>10328-29</td>
<td></td>
</tr>
<tr>
<td>10328 0D</td>
<td>Ultra-flat and ultra-broadband supercontinuum generation in photonic crystal fiber pumped by noise-like pulses</td>
<td>10328-16</td>
<td></td>
</tr>
<tr>
<td>10328 0E</td>
<td>Silicon wafer directly used as an output coupler in Tm:YAP laser</td>
<td>10328-40</td>
<td></td>
</tr>
</tbody>
</table>
A new continuous light source for high-speed imaging [10328-9]

Development of the standard for laser pulse duration in the picosecond range [10328-25]

HOLOGRAPHY AND APPLICATIONS

Ultrafast 3D imaging by holography [10328-33]

Interferometric imaging of acoustical phenomena using high-speed polarization camera and 4-step parallel phase-shifting technique [10328-37]

Calibration along the depth direction in tomographic digital holography [10328-3]

One million fps phase measurement by digital holography [10328-11]

STREAK CAMERAS AND X-RAY/PARTICLE IMAGING

Numerical model calculation of x-ray framing camera [10328-31]

Research of nested x-ray concentrator for future x-ray timing astronomy [10328-14]

Picosecond streak-cameras for bunch diagnostics in accelerators [10328-4]

Small-size streak tube for imaging lidar [10328-20]

Development, calibration and application of new generation dissector with picosecond temporal resolution [10328-39]

The development of a streak tube with improved time and spatial resolution [10328-54]

Review of concepts and applications of image sampling on high-speed streak cameras [10328-30]

Picosecond imaging of inertial confinement fusion plasmas using electron pulse-dilation [10328-46]

Large-aperture fast-neutron imaging detector with 10-ns time resolution [10328-49]

Temporally resolved proton radiography of rapidly varying electric and magnetic fields in laser-driven capacitor coil targets [10328-50]

INTEGRATED IMAGING SYSTEMS

High-speed visual feedback for realizing high-performance robotic manipulation [10328-6]

High resolution imaging of a subsonic projectile using automated mirrors with large aperture [10328-35]
A 3D imaging system for the non-intrusive in-flight measurement of the deformation of an aircraft propeller and a helicopter rotor [10328-48]

Direct evaluation method of vorticity combined with PTV [10328-52]

Simultaneous visualization of transonic buffet on a rocket faring model using unsteady PSP measurement and Schlieren method [10328-67]

**THERMAL IMAGING AND COMBUSTION**

Visualization of high-speed phenomena using high-speed infrared camera [10328-51]

High-speed visualization of thermal plasma characteristics [10328-26]

Time evolution of the high temperature region formed by laser induced breakdown and of the development of the flame kernel in the constant volume combustion vessel [10328-5]

Self-ignition and flame development of high-pressure hydrogen flow in rectangular tube by simultaneous shadowgraph and direct photograph [10328-12]

High-speed imaging of temporal thermal field in thermoplastic material during flame spread [10328-42]

Fast infrared imaging of turbulent heat transfer [10328-32]

High-speed visualization of fuel spray impingement in the near-wall region using a DISI injector [10328-57]

**BUBBLES AND DROPS**

Probing the nanoscale with high-speed interferometry of an impacting drop [10328-38]

Observation of the growth of cavitation bubble cloud by the backscattering of focused ultrasound from a laser-induced bubble [10328-44]

Condensation of vapor bubble in subcooled pool [10328-69]

Drops make a splash [10328-36]

**SHOCK WAVES IN FLUIDS**

Underwater expansion wave focusing by reflecting at the air interface [10328-2]

Explosion interaction with water in a tube [10328-62]

Background Oriented Schlieren (BOS) measurement in supersonic flow with 4K high-speed camera [10328-61]
10328 1F Shock wave strengthening through area reduction [10328-8]
10328 1G The effect of wedge position and inlet geometry on shock wave reflection [10328-15]
10328 1H The use of high-speed imaging in education [10328-17]
10328 1I High-speed flow visualization in hypersonic, transonic and shock tube flows [10328-18]
10328 1J Flow visualization around a rotating body in a wind tunnel [10328-66]
10328 1K Quantitative imaging approaches dedicated to shock-physics experiments [10328-34]
10328 1L Unsteady motion of laser ablation plume by vortex induced by the expansion of curved shock wave [10328-58]

IMPACT ON SOLID MATERIALS

10328 1M Experimental and numerical study on the unstable crack growth under uniaxial compression [10328-63]
10328 1N Dynamic strain distribution of FRP plate under blast loading [10328-68]
10328 1O High-speed imaging of impact processes [10328-55]
10328 1P Plasma measurement by optical visualization and triple probe method under high-speed impact [10328-43]
10328 1Q Optical observation of metal jet generated by high speed inclined collision [10328-45]

HUMANS AND LIVING THINGS

10328 1R High-speed atomic force microscopy for observing protein molecules in dynamic action [10328-7]
10328 1S Investigation of kinematics of knuckling shot in soccer [10328-23]
10328 1T How many fish in a tank? Constructing an automated fish counting system by using PTV analysis [10328-56]
10328 1U Shuttlecock detection system for fully autonomous badminton robot with two high-speed video cameras [10328-60]
Authors

Numbers in the index correspond to the last two digits of the seven-digit citation identifier (CID) article numbering system used in Proceedings of SPIE. The first five digits reflect the volume number. Base 36 numbering is employed for the last two digits and indicates the order of articles within the volume. Numbers start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B...0Z, followed by 10-1Z, 20-2Z, etc.

Abe, S., 1T
Abe, Y., 0T
Akamatsu, F., 13
Alighgholi, A., 05
Alpinaniz, J., 0U
Anchugov, O. V., 0P
Ando, T., 1A
Ando, T., 1R
Aoki, J., 04
Aoyama, S., 06
Arikawa, Y., 0T
Arimoto, H., 1E
Asahara, M., 14
Asai, T., 1S
Asaumi, S., 1T
Awatsuji, Yasuhiro, 0H, 0K
Azcui, H., 0T
Bailly-Grandvaux, M., 0U
Becker, J., 05
Bell, P. M., 0S
Bergström, N., 0V
Berlizov, A. B., 0G
Boden, Friz, 0Y
Boni, R., 0Q
Borremans, J., 03
Bouslife, M., 1K
Brabietz, C., 0U
Bradley, D. K., 0S
Charbon, E., 0T
Chavel, P., 1K
Chen, Guanghua, 0C
Chen, Shaorong, 0O
Chen, Yewang, 0D, 0E
Chung, T. M., 0S
Coppejans, P., 03
Craninckx, J., 03
da Silva, N. P., 1G
Dao, V. T. S., 07, 08
Delfs, A., 05
Demachi, K., 1U
Dinapoli, R., 0S
Dorokhov, V. L., 0N, 0P
Du, Chenlin, 0E
Dymoke-Bradshaw, A. K. L., 0S
Ecault, R., 1K
Ehret, M., 0U
Endo, K., 0A
Etoh, T. G., 0T, 08, 0Z
Feldman, G. G., 0G
Fisher, Y., 0Q
Frugier, P. A., 1K
Fujikawa, S., 0T
Geisler, R., 09
Gomi, Y., 04
Gornostaev, P. B., 0N, 0P
Göttlicher, P., 05
Graafsm, H., 0S
Greiffenberg, D., 05
Guo, Chunyu, 0D
Hall, R. E., 0F, 1G
Hares, J. D., 0S
Hashizume, T., 12
Hayashi, J., 13
Hilsabeck, T. J., 0S
Hiraiishi, T., 1T
Hiraki, K., 1J
Hirsemann, H., 0S
Hokamoto, K., 1Q
Homae, T., 1D
Honda, Y., 0T
Hong, S., 1S
Hori, T., 19
Horiuchi, K., 1A
Howorth, J. R., 0Q
Huang, S., 0V
Hui, Dandan, 0Q
Ikeda, Y., 0I
Imatsuji, T., 12
Inage, T., 1E
Ishii, M., 0W
Ishikawa, K., 0I
Ishikawa, M., 0V
Jaanimagi, P. A., 0Q
Jack, S., 0S
Jadwin, A., 0Q
Jia, Hui, 00
Kagawa, K., 06
Kamakura, Y., 08
Kaneko, T., 1A
Kanematsu, T., 1U
Kanzyubah, M. V., 0G
Kato, H., 04
Kato, Y., 0T
Kawahara, N., 17
Kawahito, S., 06
Kilkenny, J. D., 0S
Kimura, N., 1T
Kinoshita, S., 1P
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Introduction

The 31st International Congress on High-Speed Imaging and Photonics (ICHSIP-31) was held 6–10 November 2016, in Osaka, Japan. Co-organized by Osaka University and its Institute of Laser Engineering (Japan), Ritsumeikan University (Japan), and Kindai University (Japan), the Organizing Committee of ICHSIP-31 helped put the program and event together. It was supported by 25 societies and associations in Japan.

288 participants, including 56 students from 15 different countries, gathered at the conference. The conference program contained 51 invited talks, 152 oral talks, and 65 posters. A total of 268 papers were presented, 65 of which are included in these post-conference proceedings.

ICHSIP-31 was partially sponsored by the Tateisi Science and Technology Foundation (Japan), and by the Research Foundation for the Electrotechnology of Chubu (Japan). It was also partially supported by Vision Research Inc. (Canada)

The situation of ICHSIP-31 and its circumstances so far, must be mentioned here. Since 1952, the biennial international meeting on high-speed photography has brought together scientists, researchers, and engineers who may have different technical backgrounds, but who share one common interest: recording images of highly transient optical phenomena and photonic events. The purpose of these meetings was to provide opportunities to present their latest research results and discoveries, and mutually exchange their ideas and technical information on high-speed recording devices, as well as the application of these diagnostics to various fields of science and engineering.

While the fields of high-speed imaging have been rapidly and largely expanding, the style of the conference has not been changed for a long time. As such, changes of some kind in the process of holding the conference were inevitable. Some active colleagues discussed a scheme to energize the conference, and came to a conclusion that we should try to modify the structure of operation. Thus, we decided to start up a new committee named the International Scientific Advisory Board (ISAB) by inviting many new world-leading members from various novel and active fields related to high-speed imaging. The ISAB is a driving body for the series of the ICHSIP conferences. The members of the ISAB are expected to support the coming conference by giving their honest advice to the organizing committee and to activate the scientific field for continuation and further expansion of the conferences.

In ICHSIP-31, we aimed to review the wide range of the fields by summarizing the state-of-the-art high-speed imaging. In addition to new discoveries and technical
innovations presented in usual scientific meetings, we also intended to introduce cutting-edge ultra-fast imaging technologies and applications reviewed by leading scientists in the world in various related fields. ICHSIP-31 covered three major categories: Instrumentation and Solution Tools, Physical Applications, and Medical and Biological Applications. It was one of the highlighted features of the ICHSIP-31 to survey new ongoing research and developments in Medical and Biological Applications by introducing high-speed imaging technologies.

On the evening of Wednesday, 9 November, a panel discussion titled “Expansion and Fusion of the High-speed Imaging World: From Attosecond Pump and Probe Imaging to 10-fps AFM Imaging of Stepping Myosin-" occurred. Intense discussions on high-speed imaging and photonics from various aspects took place, resulting in exchange of information between, and finding common solutions of, totally different topics.

We have set up a three-stage publication system for “the greatest happiness of the greatest numbers:"

Abstract Book: All submitted abstracts were included in the printed abstract book delivered on-site at the conference.

Conference Proceedings: All submitted papers were included on a USB memory device delivered on-site.

Post-conference Proceedings: The submitted papers were peer-reviewed by referees, and those accepted for publication are included in these proceedings published by SPIE. A special acknowledgement must be expressed to the support of SPIE for facilitating the submission of manuscripts and assisting the compilation of the post-conference proceedings.

Three awards were established for ICHSIP-31:

The “nac High-Speed Imaging Award” was presented to outstanding contributions made in the field of high speed imaging and photonics. It was supported by nac Image Technologies Inc. (United States)

“Slow Motion Video Awards (Slow MOVA)” were presented to the executers in these categories: Excellent Slow Motion Video, Scientific Slow Motion Video, Artistic Slow Motion Video, and Entertaining Slow Motion Video. Slow MOVA was open not only to the congress participants, but to everyone. It was supported by Photron Ltd. (Japan)

“Best Poster Awards” were presented to top-evaluated poster presentations in three categories. The awards were supported by Specialised Imaging Ltd. (United Kingdom)
Winners of the Best Poster Awards were selected by participant vote. Award winners of the other two awards were selected by each selection committee. Winners were recognized during the banquet. Selected videos were shown at the banquet, which were excellent, interesting, beautiful, and fun.

An exhibition of high-speed imaging instruments took place in parallel with the scientific sessions. The latest and cutting-edge high-speed imaging devices from 15 leading companies were shown for three days. It also was an attractive event to the conference participants.

On behalf of the organizing committee of the 31st International Congress on High-Speed Imaging and Photonics, we express our most cordial acknowledgement with thanks to the great contributions made by many people for making the ICHSIP-31 a great success. It was virtually impossible to hold such a big and successful meeting without their collaborative efforts.

We consider it appropriate to express thankful acknowledgements to the distinguished authors for presenting high-quality papers, the chair persons for smooth handling of the sessions, the session participants for deep and fruitful discussions, the reviewers of the papers for their sincere efforts to make the proceedings valuable, the members of the Organizing Committee and the International Scientific Advisory Board for operation and guidance of the conference, the exhibitors for displaying cutting-edge high-speed imaging devices, the secretaries and graduate students for wonderful support, and finally, all the participants for their cooperation in all aspects of the conference.

The 32nd International Congress on High-Speed Imaging and Photonics will be held at Universiteit Twente, Netherlands, in 2018. We look forward to seeing you again in Twente, and at subsequent conferences.

Hiroyuki Shiraga
Takeharu Goji Etoh
Awards

nac High-speed Imaging Award

Rihito Kuroda, Shigetoshi Sugawa, Tohoku University (Japan)

For their development of an Ultra High Speed CMOS Image Sensor with improved light sensitivity that is capable of capturing 20 million frames per second with a significant reduction in power consumption. This sensor is now, commercially employed in the Shimadzu Hyper Vision HPV-X2 camera.

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Renato Turchetta, Rutherford Appleton Laboratory (United Kingdom)
Michel Versluis, Universiteit Twente (Netherland)

Award Administrator

Jim Walton, 4Dvideo (United States)

Slow Motion Video Awards

Excellent Video Award

Phred Peterson, Royal Melbourne Institute of Technology (Australia)
“Supersonic soda jet”

Scientific Video Award

Chihiro Inoue, The University of Tokyo (Japan)
“Senko-hanabi as Dancing Drops”

Artistic Video Award

Harald Kleine, University of New South Wales (Australia)
“Shock Wave Kaleidoscope”
Entertaining Video Award

Kentaro Takesute (Japan)
“Candle Experiment”

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Best Poster Awards

Instrumentations and Solution Tools

Shaorong Chen, Jun Zhang, Hui Jia, Qinglin Zhai, Xishun Liu, Dawei Lu, Tao Wang, Jinshou Tian, Yuman Fang, Kai He, National University of Defense Technology (China)
“Theoretical research on dynamic range and sensitivity of all optical solid-state ultrastart imaging sensor”

Physical Applications

“Ultra-high speed imaging of K-alpha emission from short-pulse laser-plasma interactions using DIXI (dilation x-ray imager)”

Bio-Medical Applications

T. Baba, K. Ikezaki, H. Sekiguchi, T. Kubo, Y. C. Sasaki, The University of Tokyo (Japan)
“X-ray imaging of single protein’s motion with Ultra-high speed and accuracy”

Sponsored by Specialised Imaging, Ltd. (United Kingdom)

Selection by Participant Vote
Award Administrator

Hiroyuki Shiraga, Osaka University (Japan)
Exhibitors

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