

# Alan Schoen 100th birth anniversary

## Gyroid is everywhere

Date November 19 - 22, 2024

Venue: November Hall, Kindai University, HigashiOsaka, Japan

### *Program*

#### November 19 (Tue)

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| 9:00 - 9:50   | Registration  |
| 9:50 - 10:00  | <b>Tomonari Dotera</b> (Kindai University)<br>Welcome remark, Introduction of Alan Schoen |
| 10:00 - 10:10 | <b>Itaru Matsumura</b> (President, Kindai University)<br>Opening address 1                |

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#### Chair: Tomonari Dotera

#### Tutorial lectures (Open lectures w/o registration)

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| 10:10 - 11:00 | <b>Randall Kamien</b> (University of Pennsylvania)<br><i>Materials Geometry</i>  |
| 11:00 - 11:10 | <b>Break</b>   |
| 11:10 - 12:00 | <b>Stephen Hyde</b> (Sydney University & Australian National University)<br><i>Triply periodic minimal surfaces revisited: surface complexes</i> |
| 12:00 - 13:30 | <b>Lunch</b>   |

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#### Chair: Gerd Schröder-Turk

#### Plenary lecture

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| 13:30 - 14:10 | <b>Myfanwy Evans</b> (University of Potsdam)<br><i>Gyroid as an organiser of entanglement</i> |
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#### Invited lectures

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|---------------|---|
| 14:10 - 14:40 | <b>Jacob Kirkensgaard</b> (University of Copenhagen)<br><i>Exploring pattern formation on negatively curved surfaces via the hyperbolic plane</i> |
| 14:40 - 15:10 | <b>Koya Shimokawa</b> (Ochanomizu University of Copenhagen)<br><i>Polycontinuous pattern and 3-dimensional topology</i>                           |

15:10 - 15:40      **Coffee break**

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**Chair: Randall Kamien**

- 15:40 - 16:00      **Hao Chen** (ShanghaiTech University)  
*Recent mathematical progress on Triply Periodic Minimal Surfaces, and how physics inspired them*
- 16:00 - 16:20      **Chern Chuang** (University of Nevada, Las Vegas)  
*Square lattice representations of P, D, and G surfaces and their mixtures and generalizations*
- 16:20 - 16:40      **Kanata Warisaya** (The University of Tokyo)  
*Reconfigurable Periodic Surfaces Assembled from Strip Modules*

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**Chair: Stephen Hyde**

- 16:40 - 16:50      **Break**
- 16:50 - 17:10      **Toshihiko Oka** (Shizuoka University)  
*Investigating electron density of gyroid structures by X - ray diffraction*
- 17:10 - 17:30      **Goran Ungar** (Xi'an Jiaotong University)  
*Skeletal bicontinuous mesophases of bundled axial rod-like molecules*
- 17:30 - 17:50      **Osamu Terasaki** (ShanghaiTech University)  
*Where and how we have met and learnt from G-surface*

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17:00 - 18:00      Move

18:00 - 19:00      **Welcome reception**

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## November 20 (Wed)

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**Chair: Yushu Matsushita**

### Plenary lecture

9:00 - 9:40      **Ulrich Wiesner** (Cornell)  
*Co-Continuous Gyroidal Hybrid Nanomaterials from Block Copolymer Self-Assembly*

### Invited lectures

9:40 - 10:10      **Rong-Ming Ho** (National Tsing Hua University)  
*Network Phases from Self-Assembly of High Interaction Parameter Block Copolymers and Chiral Block Copolymers*

10:10 - 10:40      **An-Chang Shi** (McMaster University)  
*Stabilizing network phases of block copolymers*

10:40 - 11:10      **Coffee break**

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**Chair: Osamu Terasaki**

11:10 - 11:30      **Lu Han** (Tongji University)  
*Formation of Triply Periodic Hyperbolic Surface Structures via Block Copolymer Self-Assembly*

11:30 - 11:50      **Weihua Li** (Fudan University)  
*Stabilize different continuous network phases by rationally designing block copolymers*

11:50 - 12:10      **Atsushi Takano** (Nagoya University)  
*Novel Tricontinuous Microphase-Separated Structures formed from ABC Triblock Terpolymer Blends*

12:10 - 13:30      **Lunch**

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**Chair: Goran Ungar**

### Invited lectures

13:30 - 14:00      **Xiangbing Zeng** (Sheffield)  
*How Do You Make a Gyroid Chiral?*

14:00 - 14:30      **Takahiro Ichikawa** (Tokyo University of Agriculture and Technology)  
*Gyroid Minimal Surface as Proton Conduction Pathway*

14:30 - 14:50      **Shoichi Kutsumizu** (Gifu University)  
*Control of  $1a\bar{3}d$  Gyroid phase formation in aryloyl-hydrazine-based molecules by using two chemical modifications, introducing the side group and slight non-symmetry into the core moiety*

14:50 - 15:20      **Coffee break**

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15:20-17:20      **Poster Session**

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## November 21 (Thur)

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**Chair: Jacob Kirkensgaard**

### Plenary lecture

9:00 - 9:40      **Gregory Grason** (University of Massachusetts Amherst)  
*Fitting into and shifting symmetries of block copolymer cubic networks*

### Invited lectures

9:40 - 10:10      **Philipp Schönhöfer**  
*Gyroid Simulation*

10:10 - 10:40      **Justin Llandro** (Sumitomo Chemical Co., Ltd.)  
*Magnetism and topology in self-assembled 3D gyroid nanostructures*

10:40 - 11:10      **Coffee break**

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**Chair: Kunio Awaga**

11:10 - 11:30      **Jun-ichi FUKUDA** (Kyushu University)  
*Structural transformation of cholesteric blue phases revealed by continuum simulation and machine-learning-aided structural analysis*

11:30 - 11:50      **Masahisa Tsuchiizu** (Nara Women's University)  
*Topological electronic states in microscopic gyroids*

11:50 - 12:10      **Rie Suizu** (Nagoya University)  
*Coexistence of Collinear and Non-collinear Spin Texture in Antiferromagnetic Gyroidal MOFs*

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12:10 -      **Excursion**  
*Lunchbox*  
*Sumiyoshi Taisha Shrine*  
*Yamamoto Noh Theater*  
*Osaka Castle*

**Dinner (OSAKA GEIHINKAN)**

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## November 22 (Fri)

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**Chair: Myfanwy Evans**

### Plenary lecture

9:00 - 9:40      **Matthias Saba** (Fribourg)  
*Gyroid Photonics – From Chiral Beamsplitters and Active Materials to Topological Physics and Bound States in the Continuum*

### Invited lectures

9:40 - 10:10      **Vinodkumar Saranathan** (Krea University)  
*Functional Morphology of Mesoscale Organismal Single Gyroids*

10:10 - 10:40      **Łucja Kowalewska** (University of Warsaw)  
*Beyond the Ordinary: Diamond- and Gyroid-Shaped Membranes in Plant Plastids*

10:40 - 11:10      **Coffee break**

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**Chair: Matthias Saba**

11:10 - 11:30      **Annie Jessop** (Murdoch University)  
*Reflections from a developing butterfly Gyroid*

11:30 - 11:50      **Shigeru Okamoto** (Nagoya Institute of Technology)  
*A Single Grain of OBDG in a Semi-dilute Solution - Photonic Crystal*

11:50 - 12:50      **Lunch**

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**Chair: Takahiro Ichikawa**

### Invited lecture

12:50 - 13:20      **Kunio Awaga** (Nagoya University)  
*Rational Synthesis of Molecular Gyroids and their Structure-Derived Solid-State Properties*

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### Discussion & Summary

13:20 - 14:00      **Gerd Schröder-Turk** (Murdoch University)

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### Closing remark

14:00 - 14:10      **Yushu Matsushita** (Toyota Physical and Chemical Research Institute)

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