Fiat Lux Freshman Seminars: Why are we here? - Origin of the Universe, Life, and Consciousness

Instructor:
- Katsushi Arisaka, Professor of Physics & Astronomy
- Office: Knudsen 4-146, (310) 825-4925
- E-mail: arisaka@physics.ucla.edu
- Homepage: http://home.physics.ucla.edu/~arisaka/home/

Meeting:
- Fall 2017 quarter, starting October 24 (Tue)
- Weekly meeting on Thursday at 10:00 – 11:30
- Total 7 meetings: October 24, 31, November 7, 14, 21, 28 and December 5
- Location: Knudsen 4-173.
- ~20 students

Purpose:
- Why are we here? This is the most fundamental question that has been asked repeatedly. Recent progress in particle physics and cosmology has revealed that the universe started from a tiny hot dense object called the Big Bang some 13.7 billion years ago. We also realized that there was nothing other than light at the beginning. Therefore Fiat Lux has been scientifically proven. It means that, to develop extremely complex objects such as human being, a series of so-called symmetry breaking events must be necessary to create something from nothing step by step. Four most critical symmetry-breaking events are presented and discussed: origin of the universe, particles, life, and consciousness.

Proposed Program:
The program will consist of the following:
- Weekly lecture by Arisaka (60 minutes)
- Followed by Q&A, informal discussion (30 minutes)
- Reading assignments and written short reports
- Oral presentation (on December 5)
Tentative Course Outline

<table>
<thead>
<tr>
<th>Week</th>
<th>Day</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>October 24</td>
<td>Orientation, the Universe we live, physics laws</td>
</tr>
<tr>
<td>5</td>
<td>October 31</td>
<td>Beginning of the Universe: the big bang – Fiat Lux</td>
</tr>
<tr>
<td>6</td>
<td>November 7</td>
<td>Evolution of Universe: creation of particles and structures</td>
</tr>
<tr>
<td>7</td>
<td>November 14</td>
<td>Origin and Evolution of Life</td>
</tr>
<tr>
<td>8</td>
<td>November 21</td>
<td>Origin of Brain, Lab Tour</td>
</tr>
<tr>
<td>9</td>
<td>November 28</td>
<td>Origin of Consciousness and Intelligence</td>
</tr>
<tr>
<td>10</td>
<td>December 5</td>
<td>Students short presentations (9:00 – 11:50)</td>
</tr>
</tbody>
</table>

Reading Assignment

Three popular science books below are required to read through this course. Please read “Just Six Numbers” by October 22 (Sun) and write a short (~1/2 page) book review. Please read “Life Ascending” by November 12 (Sun). Write a short book review. Then read the third book, “I of the Vortex” by December 3 (Sun).

1. Just Six Numbers: The Deep Forces That Shape The Universe  
   by Martin J. Rees, $11.65

2. Life Ascending: The Ten Great Inventions of Evolution  
   by Nick Lane, $16.95

3. I of the Vortex: From Neurons to Self  
   by Rodolfo Llinas, $16.29