WHY ARWU?

• Invented by Prof. Nian Cai Liu

• In the context of China’s will for building World-Class Universities

• Serve the strategic planning of Shanghai Jiao Tong University

• Find out the gap between top Chinese universities and World-Class universities

• From benchmarking to ranking
Academic Ranking of World Universities (ARWU)

Find out the positions of top Chinese Universities in the world higher education system

Provide one source of information for the global comparison of universities
Academic Ranking of World Universities by Broad Subject Fields (ARWU-FIELD)


Five Broad Subject Fields

- Natural Sciences and Mathematics (SCI)
- Engineering/Technology and Computer Sciences (ENG)
- Life and Agriculture Sciences (LIFE)
- Clinical Medicine and Pharmacy (MED)
- Social Sciences (SOC)
Five Subject Fields

• Mathematics
• Physics
• Chemistry
• Computer Sciences
• Economics / Business
METHODOLOGY
Selection of Universities

- Any university that has any Nobel Laureates, Fields Medals, Highly Cited Researchers, or papers in *Nature* or *Science*
- Universities with significant amount of papers indexed by Citation Indexes of Thomson

Number of universities scanned: > 2000
Number of universities actually ranked: 1200
Number of universities published:

- Top 500: ARWU
- Top 200: ARWU-FIELD
- Top 200: ARWU-SUBJECT
Criteria and Weights of ARWU

- Staff of an institution winning Nobel Prizes and Fields Medals: 20%
- Quality of Faculty: 20%
- Highly cited researchers in 21 broad subject categories: 20%
- Alumni: 10%
- Award: 10%
- Per capita performance of an institution: 10%
- Papers published in Nature and Science: 20%
- N&S: 20%
- Research Output: 20%
- PUB: 20%
- Papers indexed in Science Citation Index-expanded and Social Science Citation Index: 20%

For institutions specialized in humanities and social sciences such as London School of Economics, N&S is not considered, and the weight of N&S is relocated to other indicators.
Main Sources of Data

- **Nobel laureates:**
  http://www.nobelprize.org

- **Fields Medals:**
  http://www.mathunion.org/medals/

- **Highly Cited Researchers:**
  http://www.highlycited.com

- **Papers published in *Nature* and *Science***:
  http://www.webofknowledge.com

- **Papers indexed in SCIE and SSCI:**
  http://www.webofknowledge.com
## Average Performance of Universities in Different Rank Ranges

<table>
<thead>
<tr>
<th>Rank Range</th>
<th>Alumni</th>
<th>Award</th>
<th>HiCi (old)</th>
<th>HiCi (new)</th>
<th>N&amp;S</th>
<th>PUB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top 100</td>
<td>3.15</td>
<td>1.42</td>
<td>30.0</td>
<td>12.6</td>
<td>57.3</td>
<td>4800</td>
</tr>
<tr>
<td>101-200</td>
<td>0.50</td>
<td>0.11</td>
<td>6.9</td>
<td>3.7</td>
<td>13.9</td>
<td>3160</td>
</tr>
<tr>
<td>201-300</td>
<td>0.20</td>
<td>0.03</td>
<td>3.3</td>
<td>1.7</td>
<td>7.1</td>
<td>2180</td>
</tr>
<tr>
<td>301-400</td>
<td>0.20</td>
<td>0.01</td>
<td>1.9</td>
<td>1.0</td>
<td>3.6</td>
<td>1760</td>
</tr>
<tr>
<td>401-500</td>
<td>0.08</td>
<td>0.02</td>
<td>1.4</td>
<td>0.7</td>
<td>2.7</td>
<td>1250</td>
</tr>
</tbody>
</table>
Universities’ Ranking Performance: 2006 - 2015

ARWU 2015
ARWU 2006
Univ Geneva

Geneva's professor Stanislav Smirnov won 2010 Fields Medals

Univ Warwick

Warwick's professor Martin Hairer won 2014 Fields Medals
Data for Top 7 Chinese Universities
(Tsinghua, Peking, SJTU, Fudan, Nanjing, Zhejiang, USTC)

- Web of Science Papers: 18,477, 237%
- Nature & Science Papers: 5,281, 1691%
- Highly Cited Researchers: 23, ∞
What contributed to ranking improvement?

École polytechnique fédérale de Lausanne (EPFL)

Nanyang Technological University (NTU)
Characteristics of Well-Performing Tertiary Education Institutions: Alignment of Key Factors

- Concentration of Talent
- Abundant Resources
- Favorable Governance

Created by Jamil Salmi
• **315 Universities** appear simultaneously in ARWU, THE, QS

• 2007 and 2012 data
  – Number of academic staff
  – Number of postgraduate students
  – Research income
Increase on Number of Academic Staff for Top Universities (2007–2012)

- N T U: 53%, among Top 5%
- EPFL: 43%, among Top 8%
Increase on Number of Postgraduate Students for Top Universities (2007 – 2012)

- EPFL: 38%, among Top 15%
- NTU: 29%, among Top 24%
Increase on Research Income (2007–2012)

- NTU: 100%, among Top 5%
- EPFL: 40%, among Top 33%
Concluding Remarks

• Ranking, despite its limitations, can be used to monitor the performance of universities and discover the world-class ones.
• Ranking are very helpful tools for strategical thinking.
• Pay attention to not only overall rankings but also ranking indicators, as well as other indicators of importance.
Thank You

www.Shanghairanking.com