Global Trends in Research Landscape

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Galileo’s last and greatest work, published in 1638 by Elzevir, Discorsi e Dimostrazioni Matematiche is considered the first important discussion of modern physics.
Elsevier – Privileged Vantage Point on the Global World of Research

Elsevier – From publisher to solution provider
- Founded 130+ years ago
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- 1+ million manuscripts submitted to 2,000+ Elsevier journals
- 300,000+ articles published
- 700 million digital article downloads delivered
- Scopus: 20,000+ journals, 5,000+ publishers, > 50 million articles
- Terabytes of data: SciVal Analytics
- Interactions with every university and government
Elsevier’s Broad View of the Global World of Research

- **SciVal**: World’s largest abstract database:
  - > 50 million records
  - 20,000+ journals
  - 5,000 publishers

- **Scopus**: Full-text database of all Elsevier journals:
  - 10 million active users
  - 700 million article downloads

- **ScienceDirect**: 1 million+ manuscripts submitted to 2,200 Elsevier journals
  - 300,000+ articles published

- Serving 30 million+ scientists, students, health, and information professionals in 180+ countries
  - Terabytes of data
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A leader Scientific Full Text Database

- 12.5 million full-text articles from 2,500+ Elsevier journals
- 23 Subject Collections
- Backfiles dating back to 1823
- Early access to preprints via Articles in Press
- 150+ Reference Works
- 141 Book Series in 6 packages (63 titles)
- 6 series Handbooks (164 volumes)
- 20,000 eBooks
Scopus has launched the Cited References Expansion project to expand the database’s citation data back to 1970. Ambitious in scope, the Archive will embrace all subjects and all major publishers for which a digital archive is available. The project is scheduled to run until 2016, when an estimated 8 million articles will have been re-indexed to include cited references.

<table>
<thead>
<tr>
<th>Abstracts and citations from &gt; 5,000 publishers</th>
<th>2,600 Open Access journals</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.5 Million conference papers (10% of Scopus records)</td>
<td>80% of all Scopus records have an abstract</td>
</tr>
<tr>
<td>“Articles in Press” from more than 3,850 titles</td>
<td>Abstracts going back to 1823</td>
</tr>
<tr>
<td>24 Million Patents</td>
<td>40 languages covered</td>
</tr>
<tr>
<td>&gt; 21,500 titles</td>
<td>315 m integrated scientific websites via Scirus</td>
</tr>
<tr>
<td>18,900 Peer reviewed journals</td>
<td>Trade journals</td>
</tr>
<tr>
<td>390</td>
<td>Book series</td>
</tr>
</tbody>
</table>

**Fall 2013:** Scopus has started to increase book coverage to 75,000 titles (project completion date 2015)
Key Trends

Science is becoming more global and more complex

- Growth
- International Collaboration
- Emerging Markets
- Interdisciplinarity
Agenda

Growth

Emerging Markets

Interdisciplinary

International Collaboration
R&D Input: Money

Source: Battelle and R&D Magazine’s “2014 Global R&D Funding Forecast”
R&D spending, selected countries 2000–2016

Source: OECD, May 2013, Gross Expenditure on Research & Development (GERD) - ($) Mill Constant Prices Base Year 2005, PPP
R&D - Countries

Size of circle reflects the relative amount of annual R&D spending by the indicated country

- North America
- South America
- Europe
- Middle East & Africa
- Asia-Pacific
- Russia - CIS

Source: Belfield, R&D Magazine, International Monetary Fund, World Bank, CIA Fact Book, OECD
Growing researcher community

Sources: OECD, Battelle; Indexed values: 100 = Number of researchers in 1981

<table>
<thead>
<tr>
<th>Year</th>
<th>Researchers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>100</td>
</tr>
<tr>
<td>1985</td>
<td>150</td>
</tr>
<tr>
<td>1990</td>
<td>200</td>
</tr>
<tr>
<td>1995</td>
<td>250</td>
</tr>
<tr>
<td>2000</td>
<td>300</td>
</tr>
<tr>
<td>2005</td>
<td>350</td>
</tr>
<tr>
<td>2010</td>
<td>400</td>
</tr>
</tbody>
</table>

Number of Researchers globally (2013): 7MM
Annual growth: +4%

Sources: OECD, Battelle; Indexed values: 100 = Number of researchers in 1981
Increasing number of publications

Sources: MAS-ISI, May 2013, as per the 10 Year Trends section of the Article & Citation Share Analysis

Number of publications produced worldwide

54% growth in 12 years

Sources: MAS-ISI, May 2013, as per the 10 Year Trends section of the Article & Citation Share Analysis
### Azerbaijan’s Article Output (1996-2014)

**Scopus**

**Search** | **Alerts** | **My list** | **Settings**
---|---|---|---

**AFFILCOUNTRY (azerbaijan)**

- **9,116 document results**

**Search within results...**

**Refine**

<table>
<thead>
<tr>
<th>Source Title</th>
<th>Limit to</th>
<th>Exclude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azerbaijan Medical Journal</td>
<td>(1,261)</td>
<td></td>
</tr>
<tr>
<td>Inorganic Materials</td>
<td>(260)</td>
<td></td>
</tr>
<tr>
<td>Russian Journal of Applied Chemistry</td>
<td>(177)</td>
<td></td>
</tr>
<tr>
<td>2012 6th International Conference Problems of Cybernetics and Informatics POI 2012 Proceedings</td>
<td>(146)</td>
<td></td>
</tr>
<tr>
<td>Petroleum Chemistry</td>
<td>(142)</td>
<td></td>
</tr>
</tbody>
</table>

**Year**

- 2014 | 74
- 2013 | 700
- 2012 | 1,000
- 2011 | 890

**Articles**

1. **Observation of a new particle in the search for the Standard Model Higgs boson with the ATLAS detector at the LHC**
   - Authors: Aad, G.; Abajian, T.; Abbott, B.; (...), Zutshi, Y.; Zawalinski, L.
   - Year: 2012
   - Journal: Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics
   - Citations: 928

2. **The ATLAS experiment at the CERN large hadron collider**
   - Authors: Aad, G.; Abat, E.; Abdallah, J.; (...), Nedden, M.Z.; Zychacek, Y.
   - Year: 2008
   - Journal: Journal of Instrumentation
   - Citations: 653

3. **Rapid molecular detection of tuberculosis and rifampin resistance**
   - Authors: Boehme, C.C.; Nabeto, P.; Hillemann, D.; (...), Alland, D.; Perkins, M.D.
   - Year: 2010
   - Citations: 607

4. **Update on avian influenza A (H5N1) virus infection in humans**
   - Authors: Abdel-Ghafar, A.-N., Chotpitayasunondh, T., Gao, Z.; (...), Soerono, S.; Uyei, T.M.
   - Year: 2008
   - Citations: 424

5. **Combined search for the Standard Model Higgs boson using up to 4.9 fb-1 of pp collision data at s=7 TeV with the ATLAS detector at the LHC**
   - Authors: Aad, G.; Abbott, B.; Abdallah, J.; (...), Zutshi, Y.; Zawalinski, L.
   - Year: 2012
   - Journal: Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics
   - Citations: 387
**Azerbaijan Number of Scientific Publication by Journal**

<table>
<thead>
<tr>
<th>Source</th>
<th>Document</th>
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<tbody>
<tr>
<td>Azerbaijan Medical Journal</td>
<td>1281</td>
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<tr>
<td>Inorganic Materials</td>
<td>280</td>
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<tr>
<td>Russian Journal of Applied Chemistry</td>
<td>177</td>
</tr>
<tr>
<td>2012 4th International Conference Problems of</td>
<td>146</td>
</tr>
<tr>
<td>Petroleum Chemistry</td>
<td>142</td>
</tr>
<tr>
<td>Automatic Control and Computer Sciences</td>
<td>123</td>
</tr>
<tr>
<td>Russian Journal of Inorganic Chemistry</td>
<td>120</td>
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<tr>
<td>Semiconductors</td>
<td>107</td>
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<tr>
<td>Physics Letters Section B Nuclear Elementary P</td>
<td>105</td>
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<tr>
<td>Russian Journal of Organic Chemistry</td>
<td>98</td>
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<tr>
<td>Socar Proceedings</td>
<td>97</td>
</tr>
<tr>
<td>Physical Review D Particles Fields Gravitation</td>
<td>86</td>
</tr>
<tr>
<td>Turkish Journal of Physics</td>
<td>80</td>
</tr>
</tbody>
</table>

Source: Scopus
Azerbaijan’s Article Output (1996-2014)

Source: Scival
Agenda

Growth

Emerging Markets

Interdisciplinary

International Collaboration
Emerging Countries Article Output Growth

Number of articles per year (‘000)

Source: Scopus; projections based on trend information
Agenda

Growth

Emerging Markets

Interdisciplinary

International Collaboration
Trend 3: Interdisciplinary

Source: SciVal
Agenda

Growth

Emerging Markets

Interdisciplinary

International Collaboration
Trends in International Collaboration

Increase in the proportion of the world’s papers produced with more than one international author, 1996–2008.

Source: Knowledge, networks and nations. Global scientific collaboration in the 21st century. The Royal Society
International Collaboration

Citations Per Article v. Number of Collaborating Countries

Source: Knowledge, networks and nations, The Royal Society, 2011
Collaboration – Per Co-authorship Type

Source: International Comparative Performance of the UK Research Base – 2011
A report prepared for the Department of Business, Innovation and Skills, UK by ELSEVIER B.V
Azerbaijan's Collaboration Trend (1996-2014)

Source: Scival
### Azerbaijan’s Top 10 Collaborated Countries

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Number of Documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Turkey</td>
<td>1400</td>
</tr>
<tr>
<td>2.</td>
<td>Russian Federation</td>
<td>800</td>
</tr>
<tr>
<td>3.</td>
<td>United States</td>
<td>600</td>
</tr>
<tr>
<td>4.</td>
<td>Germany</td>
<td>500</td>
</tr>
<tr>
<td>5.</td>
<td>United Kingdom</td>
<td>400</td>
</tr>
<tr>
<td>6.</td>
<td>France</td>
<td>300</td>
</tr>
<tr>
<td>7.</td>
<td>Italy</td>
<td>200</td>
</tr>
<tr>
<td>8.</td>
<td>Japan</td>
<td>100</td>
</tr>
<tr>
<td>9.</td>
<td>Spain</td>
<td>100</td>
</tr>
<tr>
<td>10.</td>
<td>Switzerland</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Scopus
Benchmarking: Article output – Int’l Collaboration – Citation Per Publication (Bubble Size) (1996-2014)

Source: Scival
Key Trends

Science is becoming more global and more complex

Growth
Emerging Markets
Interdisciplinarity
International Collaboration
Thank you!

Any questions?