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# Conditions for a successful scientific cooperation of Ukraine with countries of EU

*Vladimir MAYER*

*Centre National de la Recherche Scientifique (France),  
Moscow Office for EE&CA*



# Organization and management of S&T in Ukraine compared to EU countries

## – some prime issues to be addressed

### *What is different ?*

- double role of the Academies of sciences - learned society and research performing organization
- percentage of university personnel engaged in research relatively low
- salaries generally low, partly covered by projects, disparities
- difficulty to attract young people, high average age of researchers
- considerable portion of research personnel without a scientific degree
- pyramidal structure of organization, long terms of “staying in power”
- publishing policy (national publications versus international publications)
- system of evaluating laboratories and researchers (external experts, use of bibliometric indicators)



# Use of statistical and bibliometric indicators in evaluating the state of S&T system in Ukraine

- absolute values do not say much
- observe evolution of the same indicator in time (period after 1990)
- compare the same indicator for Ukraine with other countries
  - selecting related countries (Russia, Poland)
  - normalizing might be necessary

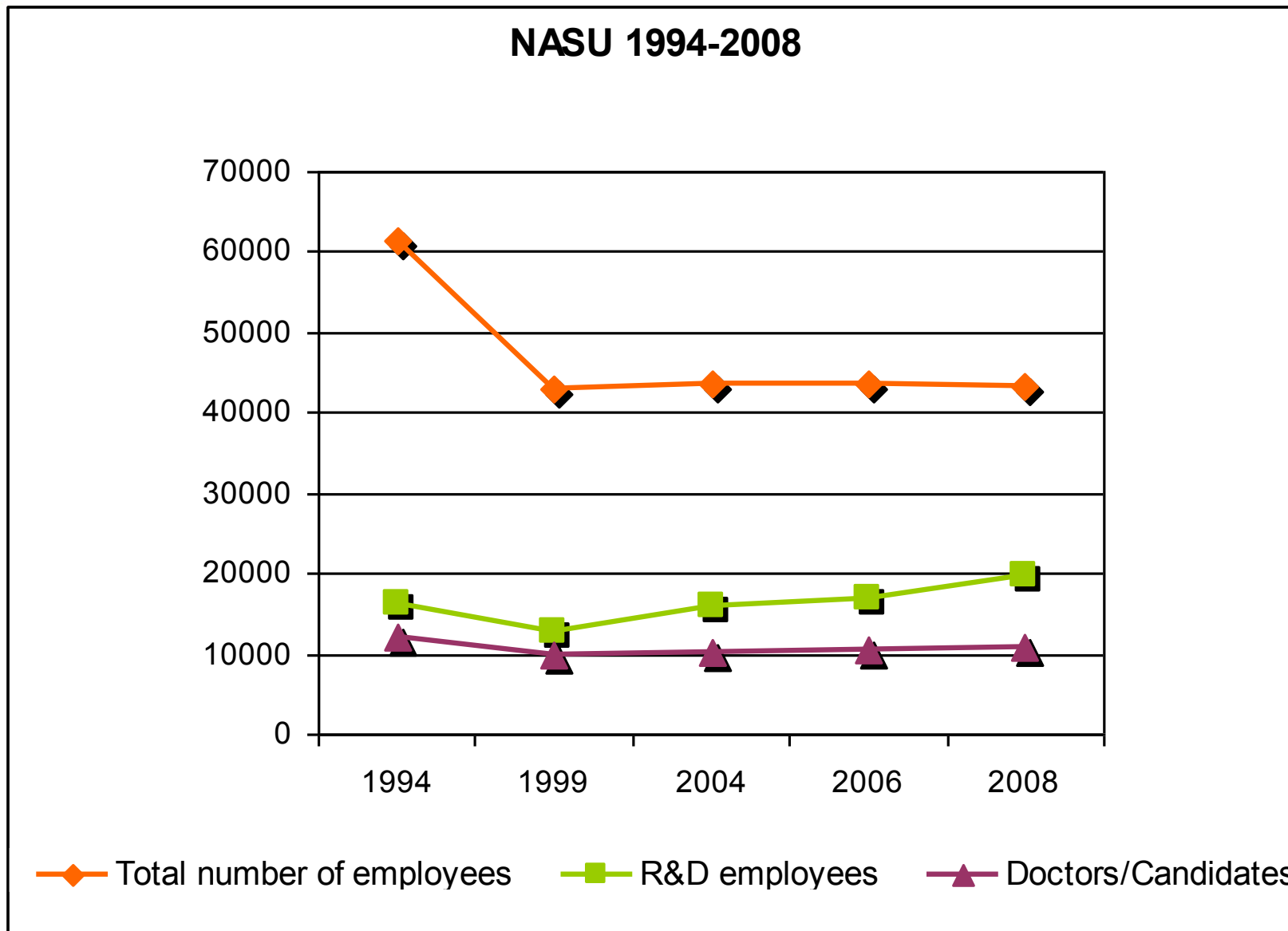


# Funding of elite organizations performing basic research in EU and EECA (2008)

| <b>Organization</b>                  | <b>NASU</b><br>Ukr | <b>RAS</b><br>Rus | <b>PAS</b><br>Poland | <b>CAS</b><br>Czech R | <b>CNRS</b><br>France | <b>Max Planck. G</b><br>Germany |
|--------------------------------------|--------------------|-------------------|----------------------|-----------------------|-----------------------|---------------------------------|
| <i>Characteristics</i>               |                    |                   |                      |                       |                       |                                 |
| <i>Number of researchers</i>         | <b>19 820</b>      | <b>49 683</b>     | <b>4000</b>          | <b>2600</b>           | <b>11 500</b>         | <b>4 417</b>                    |
| <i>Budgetary financing (M€)</i>      | 181                | 948               | 170 ?                | 200                   | 2 300                 | 1 176                           |
| <i>Off-budgetary financing (M€)</i>  | 132                | 597               | 32 ?                 | 140                   | 510                   | 258                             |
| <i>Total financing (B€)</i>          | <b>313</b>         | <b>1 545</b>      | <b>202 ?</b>         | <b>340</b>            | <b>2 810</b>          | <b>1 434</b>                    |
| <i>Financing per researcher (T€)</i> | <b>15.8</b>        | <b>31.1</b>       | <b>50.5 ?</b>        | <b>131</b>            | <b>244</b>            | <b>325</b>                      |

1 € = 8 hr.

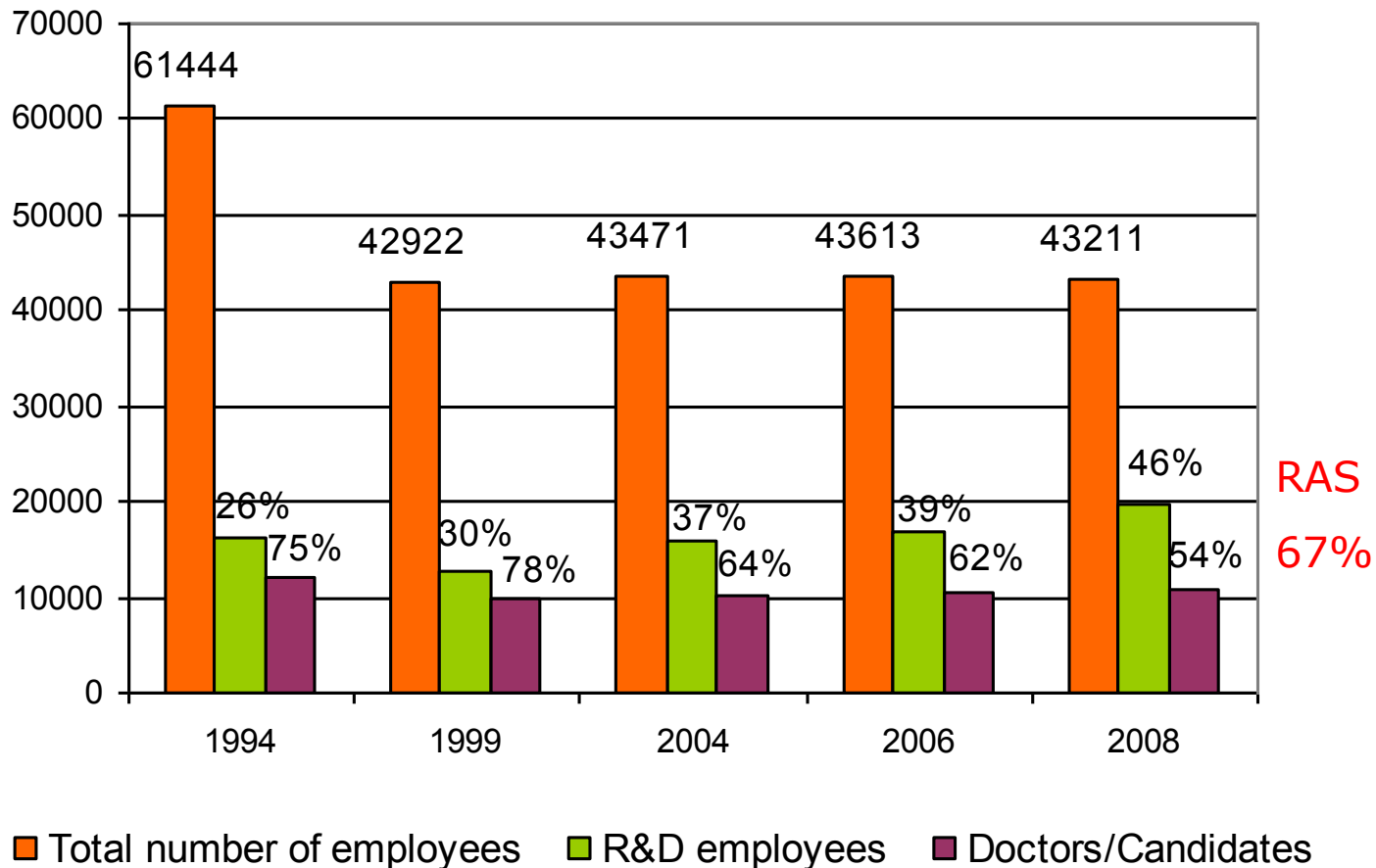
2005 data



Source: NASU Brief annual reports

# National Academy of Sciences of Ukraine – development of personnel composition (2)

**NASU 1994-2008**



# Evolution of scientific publications reported in Ukraine

Number of scientific journals: 71 (1991), over 1000 in 2002

Number of scient. publications: 80 000 (1991), 180 000 (2001)

Number of publ. abroad : 6 000 (1991) 18 000 (1999)

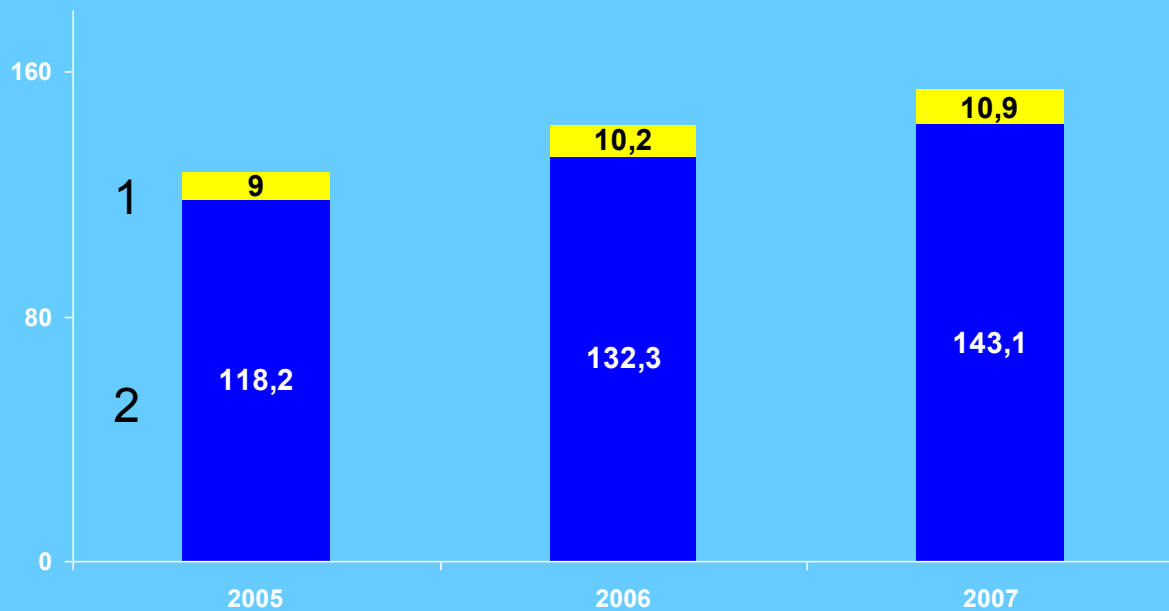
Nu. of Ukr. publ. in int. databases: constant 4000-4500 (1991-1999)

Source: Naukovii profil Ukrainy, British Council 2002

Scientific articles published by Ukr. Universities (thous. units):

1 – in foreign publishing houses

2 – in Ukrainian publishing houses



Source: Min Edu. Sci. Ukr. (2008)



# Bibliometry of European publications according to Scopus data base for a period 1996 - 2007

(source Nataliya Shulga, Ukr. Scient. Club))

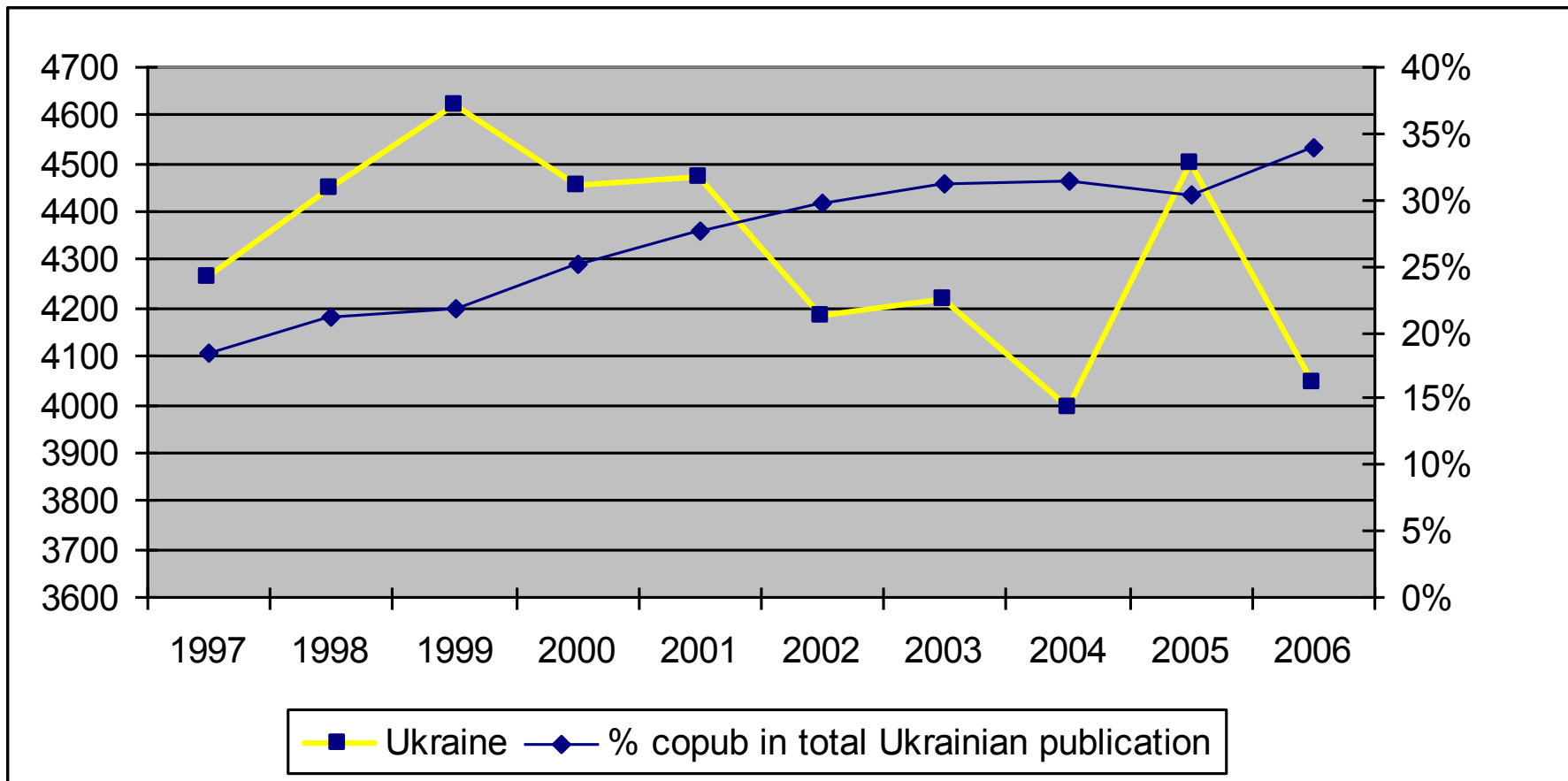
| Country                                    | UKR         | RUS          | POL         | FRA         | GER         |
|--|-------------|--------------|-------------|-------------|-------------|
| <i>Characteristics</i>                     |             |              |             |             |             |
| <i>Population(mil)</i>                     | <b>46.2</b> | <b>141.7</b> | <b>38.6</b> | <b>65.1</b> | <b>82.1</b> |
| <i>Annual number of publ. (th)</i>         | <b>5.46</b> | <b>30.8</b>  | <b>15.3</b> | <b>61.0</b> | <b>84.4</b> |
| <i>Annual number of citations (th)</i>     | <b>14.9</b> | <b>113</b>   | <b>75.4</b> | <b>624</b>  | <b>907</b>  |
| <i>Number of publications (normalized)</i> | <b>1</b>    | <b>5.6</b>   | <b>2.8</b>  | <b>11.2</b> | <b>15.5</b> |
| <i>Number of citations (normalized)</i>    | <b>1</b>    | <b>7.6</b>   | <b>5.1</b>  | <b>42</b>   | <b>61</b>   |

**Number publ. 2008 (th)** **6.14** **31.8** **21.0**



# Bibliometrics of Ukrainian publications in ISI data bases; total number, co-publications with EU

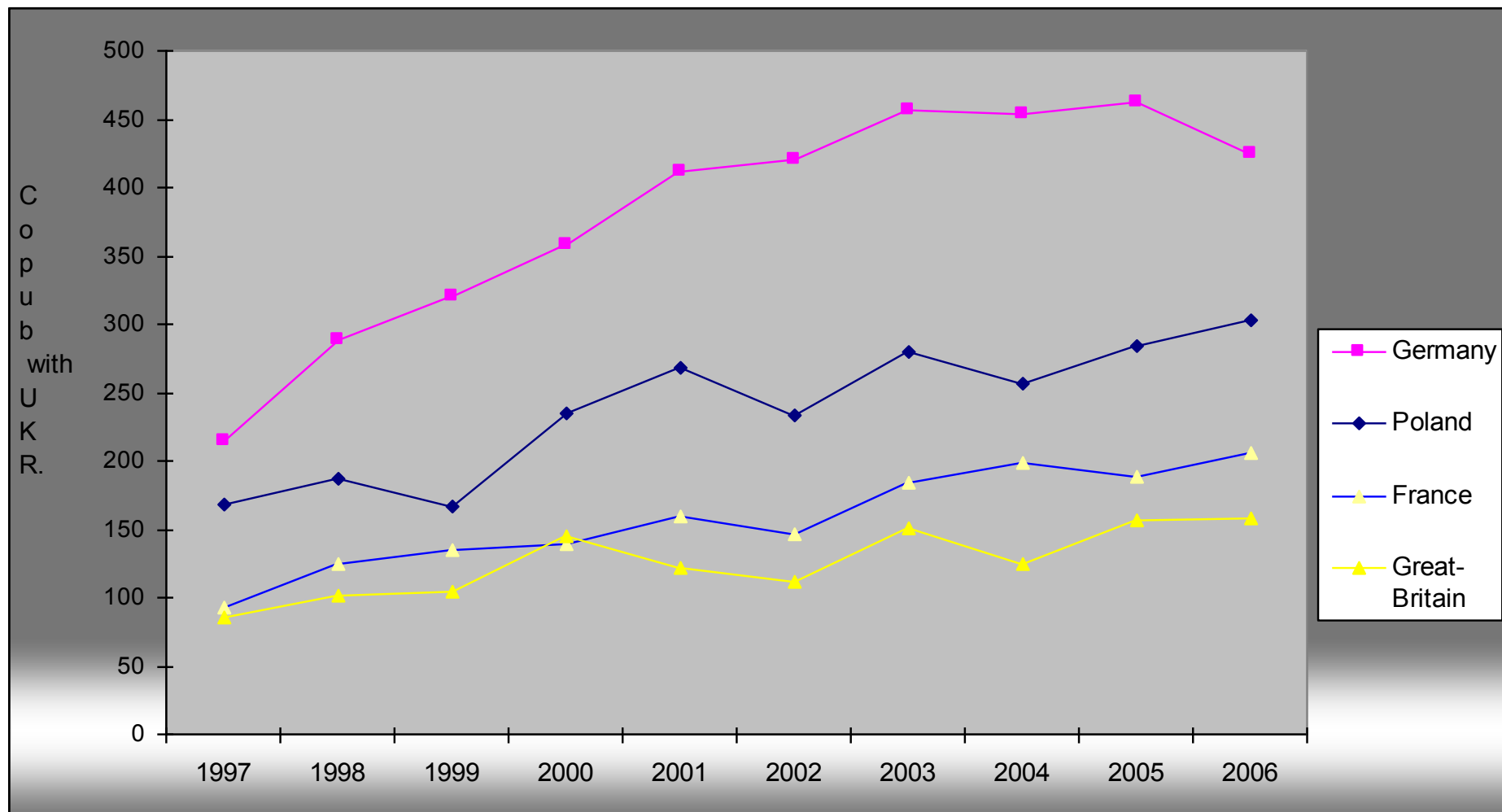
(source Scope East project)



- **only small portion of publications reported in Ukraine is listed**
- about six times less publications listed compared to Russia
- share of the EU co-publications increases steadily from 18% (1997) to 33% (2006)
- this trend is independent from the evolution in the number of Ukrainian publications

# Bibliometrics of Ukrainian publications in ISI data bases; co-publications Ge, Pol, Fr, GB

(source Scope East project)



- approximately six times less copubl of Ge and Fr with Ukr than with Ru
- Poland an important co-publication partner



# Thematics of co-publications between Ukraine and EU (2001- 06)

(source Scope East project)

| THEMATICS                               | %     |
|---|-------|
| PHYSICS, CONDENSED MATTER               | 16,2% |
| MATERIALS SCIENCE,<br>MULTIDISCIPLINARY | 13,4% |
| CHEMISTRY, PHYSICAL                     | 12,1% |
| PHYSICS, APPLIED                        | 11,3% |

- Four thematics - over one half (53%) of all co-publications (six in Russia)
- Chemistry – strongly present (about twice higher share than with Russia)
- Life sciences - a small part of cooperation (molecular biology 2.4%)



# Main Ukrainian laboratories involved in co-publications with EU (2001- 2006)

(source Scope East project)

|                                     |         |
|-------------------------------------|---------|
| 1. NASU Phys&Technol. Inst.         | Kharkov |
| 2. NASU Mol. Biol. And Genetics     | Kiev    |
| 3. NASU Org. Chem.                  | Kiev    |
| 4. NASU Phys. Chem.                 | Kiev    |
| 5. NASU Metal Physics               | Kiev    |
| 6. NASU Problems Mat. Science       | Kiev    |
| 7. NASU Applied System Analysis     | Kiev    |
| 8. NASU Condensed Matter Phys.      | Lviv    |
| 9. NASU Mathematics                 | Kiev    |
| 10. NASU Inst. Phys.                | Kiev    |
| 11. NASU Macromol. Chem.            | Kiev    |
| 12. NASU Magnetism                  | Kiev    |
| 13. Astronom. Obs., Univ. Menchikov | Kiev    |

- NASU dominating copublications EU (physics, chem., mol; biol., math)
- Kiev a leading town in cooperations
- Absence of leading University labs (it is not the case in Russia !)

# Universities in Ukraine: comparing ratings

| Rating | University                               | City           | UNESCO | Kompas | Total |
|--------|--|----------------|--------|--------|-------|
| 1-2    | Shevchenko University                    | Kiev           | 1      | 2      | 3     |
| 1-2    | Polytechnics                             | Kiev           | 2      | 1      | 3     |
| 3-4    | Kiev-Mogiliansky Academy                 | Kiev           | 9      | 3      | 12    |
| 3-4    | Polytechnics                             | Kharkov        | 5      | 7      | 12    |
| 5      | Getman Economic University               | Kiev           | 11     | 5      | 16    |
| 6      | State University                         | Donetsk        | 8      | 9      | 17    |
| 7      | Polytechnics                             | Lviv           | 12     | 6      | 18    |
| 8-9    | Technical University                     | Donetsk        | 15     | 4      | 19    |
| 8-9    | State University                         | Dnepropetrovsk | 7      | 12     | 19    |
| 10     | Mining university                        | Dnepropetrovsk | 6      | 15     | 21    |
| 11     | Aviation University                      | Kiev           | 13     | 13     | 26    |
|        | <i>Karazin State University</i>          | <i>Kharkov</i> | 3      | ?      |       |
|        | <i>Bogomolets University of Medicine</i> | <i>Kiev</i>    | 4      | ?      |       |

Shevchenko and Polytechnic Universities in Kiev are undoubtful leaders in ratings

# 7th Frame programme of EC 2007-2013 (1)

**Total budget for 7 years of FP7: 50,5 Billion €**

(Total budget for 5 years of FP6: 19.1 Billion € !)

Main programme blocks:

COOPERATION *31,4 B€*

MOBILITY (Marie Curie) *4,7 B€*

IDEAS (ERC) *7,5 B€*

CAPACITIES *4,2 B€*

## 7th Frame programme of EC 2007-2013 (2)

### Cooperation: overall success rates of proposals after 29 months:

#### By teams:

All countries: 18,4 %, ERA countries: 18.9 %, Third countries: 16,7 %

Russia 16 %, Ukraine 14 %

#### By projects:

**Russia** (1st country outside ERA) 1174 applic., 175 mainlisted (12,7 %)

**Ukraine** (8th country outside ERA) 410 applic., 54 mainlisted (13,1 %)

**Poland** 437 ? mainlisted

## Block CAPACITIES (logistic support of S&T in EU):

### *Main sub-blocks:*

- Research Infrastructures
- Research serving SMEs
- Regions of knowledge
- Research potential
- Science in society
- **Activities of international cooperation**

***Actions:* INCO-NET, BILAT, ERA-NET,  
ACCESS, ERAWIDE**

*Russia*

184 applic., 54 mainlisted (29,3 %)

*Ukraine*

79 applic., 22 mainlisted (27,8 %)



## Activities of international cooperation FP7 concerning building up collaborations with EECA countries :

Following Scope-East programme of FP6:

- **INCO NET EECA**      *(2008, 48 months, 4 M€)*      **POL particip.**
- INCO NET CA/SC      *(2009, 48 months, 1,7M€)*
- ERA-NET Rus      *(2009, 48 months, 3,1 M€)*
- **ERA-NET Black sea**      *(2009, 48 months, 3 M€)*
- **BILAT Ukraine**      *(2008, 36 months, 0,6 M€)*      **POL particip.**
- BILAT Russia      *(2008, 36 months, 0,6 M€)*
- ACCESSRU      *(2009, 30 months, 0,5 M€)*
- **ERAWIDE**      *(2010, 36 months, 0,5 M€)*