

POSTECH Experience on Building International Collaboration into Research Programs

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Pohang University of Science and Technology (POSTECH) was founded as Korea's first research-oriented university in 1986 by POSCO, one of the world's largest steel manufacturers. Our goals are: 1) to provide high quality education to a small number of talented students to foster world-class leaders; 2) to conduct in-depth research in basic sciences and engineering through collaborations with other world's leading universities; and 3) to translate research into application through industry-academia-research cooperation.

We are committed to the following strategies to achieve this mission:

- Provide undergraduate and graduate curriculums with abundant opportunities for students to partake in research programs on a global scale;
- Recruit faculty members from the world's most prestigious institutions to carry out education and research, with support of talented students and researchers for the world's great challenges in science and technology;
- Pursue inter-university and cross-disciplinary research programs with strong academic and social impact;
- Foster global leaders through both collaboration with more than sixty partner universities and international cooperation programs.

We are keen to establish new research collaboration with world's renowned institutions, maintain and expand existing cooperation, and advance POSTECH as the world's education and research institution.

This presentation is to introduce our experiences on international research collaborations in detail, and to address our position in today's global network of colleges and universities. We also discuss our vision for further development as a Korea's leading research-oriented university.

POSTECH Experience: Building International Collaboration into Research Programs

January 2008

POHANG UNIVERSITY OF SCIENCE AND TECHNOLOGY

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- Research Overview
- Infrastructure
- International Collaboration

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THINKING OF SCIENCE, THE NATION AND THE FUTURE

Campus



Land: 1,670,976m²
(413 Acre)
Building: 411,527m²
Student: 2,998
1,312 (undergraduate)
1,686 (graduate)
Faculty: 234
Researcher: 748
(Post-doctoral: 178)
Staff: 232
Regular: 205
Others: 27
(As of Oct 2007)

(1) PAL: Pohang Accelerator Laboratory
(2) RIST: Research Institute of Industrial Science and Technology
(3) PBC: Pohang Biotech Center
(4) PIRG: POSTECH Biotechnology Center

THINKING OF SCIENCE, THE NATION AND THE FUTURE

Overview

Chronology

1986	• Pohang Institute of Science and Technology open as the first research-oriented university in Korea
1992	• Graduate School of Information Technology (GSIT) open
1994	• Pohang Accelerator Laboratory, PAL (3rd-generation accelerator: 2 GeV) open • Change official name to Pohang University of Science and Technology
1995	• Graduate School of Iron & Steel Technology (GSIST) open
1996	• School of Environmental Science and Engineering (SEE) open
1998	• <i>Asiaweek Magazine</i> ⁽¹⁾ rank POSTECH #1 among Asian science & technology univ.
2001	• Asia Pacific Center for Theoretical Physics (APCTP) headquarters move to POSTECH
2002	• <i>JoongAng Daily</i> ⁽²⁾ rank POSTECH #1 among Korean universities • Ministry of Education, & Human Resources select POSTECH as 'Excellent university for educational reform' (7 years in a row)
2003	• POSTECH Biotech Center, PBC open • <i>JoongAng Daily</i> ⁽²⁾ rank POSTECH #1 among Korean universities • Tae-Joon Park Digital Library open
2005	• <i>JoongAng Daily</i> ⁽²⁾ rank POSTECH #1 among Korean universities (4 years in a row)
2006	• POSTECH Vision 2020 Declaration Ceremony
2007	• <i>JoongAng Daily</i> ⁽²⁾ rank POSTECH #1 among Korean universities • <i>The Times Higher Education Supplement</i> ⁽³⁾ rank POSTECH #11 in Citations per Faculty

(1) Published in Hong Kong (2) Major Korean daily newspaper (3) Published in United Kingdom

THINKING OF SCIENCE, THE NATION AND THE FUTURE

Academic Programs

Overview

- 10 undergraduate departments, 13 graduate programs
- Faculty to undergraduate students ratio: 1 to 6
- Admit 300 freshmen per year representing top 1% of high school graduates

Undergraduate	Graduate
Chemistry Life Science Mathematics Physics Chemical Eng. Computer Science & Eng. Electrical & Electronic Eng. Industrial & Management Eng. Materials Science & Eng. Mechanical Eng. (Division of Humanities & Social Sciences)	Chemistry Molecular & Life Sciences Mathematics Physics Electrical & Computer Eng. Materials Science & Eng. Mechanical & Industrial Eng. School of Interdisciplinary Biosci. & Bioeng. School of Environmental Science & Eng. Graduate School for Information Tech. Graduate Institute of Ferrous Technology Technology Innovation & Management Graduate Program

THINKING OF SCIENCE, THE HARDWARE AND THE FUTURE

Post-Graduate Careers

Employment rates for 2006 graduates

Degree	Graduates	Enter Graduate School		Employment	Military Service
		POSTECH	Others		
B.S.	315 (100%)	149 (47.4%)	50 (15.8%)	112 (35.6%)	4 (1.2%)
M.S.	198 (100%)	62 (31.3%)	8 (4.0%)	128 (64.7%)	0 (0%)
Ph.D.	124 (100%)	-	-	123 (99.2%)	1 (0.8%)
Total			637		

THINKING OF SCIENCE, THE HARDWARE AND THE FUTURE

Financial Data

Overview

Fiscal year 2006
Operating Expenditures (in millions): USD256.2M

Income Breakdown:

- Government: \$29.8M (12%)
- Others: \$44.9M (18%)
- Endowments: \$74.8M (30%)
- Research Projects: \$88.2M (35%)
- Tuition: \$14.3M (5%)

Expenditure Breakdown:

- Operating Activities: \$19.1M (8%)
- Others: \$20.8M (8%)
- Salaries & Benefits: \$40.1M (15%)
- Fixed Assets: \$76.6M (30%)
- Research Funds: \$88.6M (35%)
- Student Costs and Aid: \$11.0M (4%)

THINKING OF SCIENCE, THE HARDWARE AND THE FUTURE

International Network

Overview

68 partner universities in 18 countries

Australia (4): The Australian National U, U of New South Wales, U of Queensland, U of Melbourne

Austria (1): Technische Universität Graz

Canada (1): U of Waterloo

China (13): Shanghai Jiao Tong U, Harbin Institute of Technology, Tsinghua U, Beijing U of Aeronautics & Astronautics, Beijing U of Posts & Telecommunications, Beijing U of Science & Technology, Tsinghua U, Harbin Institute of Technology, Fudan U, Nankai U, Peking U, Xidian U, Harbin Institute of Technology, Harbin Institute of Technology, Harbin Institute of Technology

Denmark (1): Technical U of Denmark

France (10): Ecole Centrale de Nantes, Ecole Nationale Supérieure des Mines de Saint-Etienne, ENSCM, ENSCM, Ecole Polytechnique, Institut National des Sciences Appliquées de Lyon, Institut National des Sciences Appliquées de Grenoble, Institut National Polytechnique de Bordeaux, Université de Technologie de Compiègne, Université de Technologie de Belfort-Montbéliard, Université de Technologie de Troyes

Germany (5): Freie Universität Berlin, RWTH Aachen, RWTH Aachen, Technische Universität Berlin, Technische Universität Kaiserslautern

Italy (1): Politecnico di Torino

Japan (6): Kyoto U, Ritsumeikan Asia Pacific U, Ritsumeikan U, Tokyo Institute of Technology, Tokyo Institute of Technology, U of Auckland

South Korea (1): Pohang Institute of Technology

Switzerland (1): Eidgenössische Technische Hochschule Zürich

Taiwan (2): National Tsing Hua U, National U of Taiwan

United Kingdom (3): U of Birmingham, U of Birmingham, U of Birmingham

United States (9): U of California, Berkeley, U of California, Berkeley, U of Illinois at Urbana-Champaign, U of Illinois at Urbana-Champaign, U of Minnesota, Twin Cities, U of Minnesota, Twin Cities, U of Washington, Seattle, U of Washington, Seattle

Vietnam (4): Hanoi U of Technology, Hanoi U of Technology, Hanoi U of Technology, Hanoi U of Technology, Vietnam National U, Ho Chi Minh, Vietnamese Academy of Science and Technology

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International Network

The Association of East Asian Research Universities (AEARU)
17 members
Activities: annual meeting, student camps, symposiums, workshops

China (5)
Fudan U
Nanjing U
Peking U
Tsinghua U
USTC

Taiwan (2)
National Taiwan U
National Tsing Hua U

Korea (3)
POSTECH
KAIST
SNU

Japan (6)
Kyoto U
Osaka U
Tohoku U
TokyoTech
U of Tokyo
U of Tsukuba

Hong Kong (1)
HKUST

Overview

National Ranking

JoongAng Daily

Year/Rank	#1	#2	#3
2007	POSTECH	Korea Advanced Institute of Science and Technology (KAIST)	Seoul National University (SNU)
2006	KAIST	POSTECH, SNU	
2005	POSTECH	KAIST	SNU
2004	POSTECH	KAIST	SNU
2003	POSTECH	KAIST	SNU
2002	POSTECH	KAIST	SNU
2001	KAIST	POSTECH	SNU
2000	KAIST	POSTECH	SNU
1999	KAIST	POSTECH	SNU
1998	KAIST	POSTECH	SNU
1997	POSTECH	KAIST	SNU
1996	POSTECH	KAIST	SNU
1995	KAIST	POSTECH	SNU

OVERALL RANKINGS

THINKING OF SCIENCE, THE RADIATION AND THE FUTURE

International Ranking

The Times Higher Education Supplement

2007	2006	University	Country	Score
1	1	California Institute of Technology	US	100
2	3	Stanford University	US	100
3	4	Massachusetts Institute of Technology	US	98
4	9	Ecole Normale Supérieure, Paris	France	98
5	12	University of Alabama	US	98
6	10	Princeton University	US	97
7	2	Harvard University	US	96
8	13	Johns Hopkins University	US	96
9	112	University of Zurich	Switzerland	95
10	6	University of California, San Diego	US	95
11	25	POSTECH	Korea	95

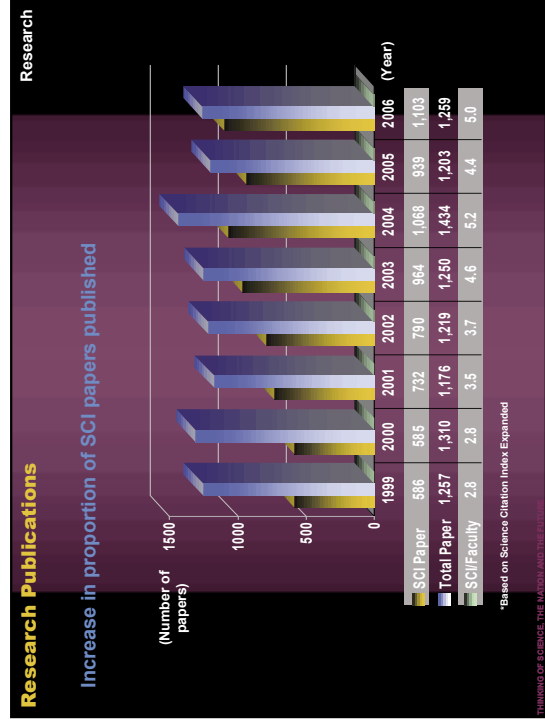
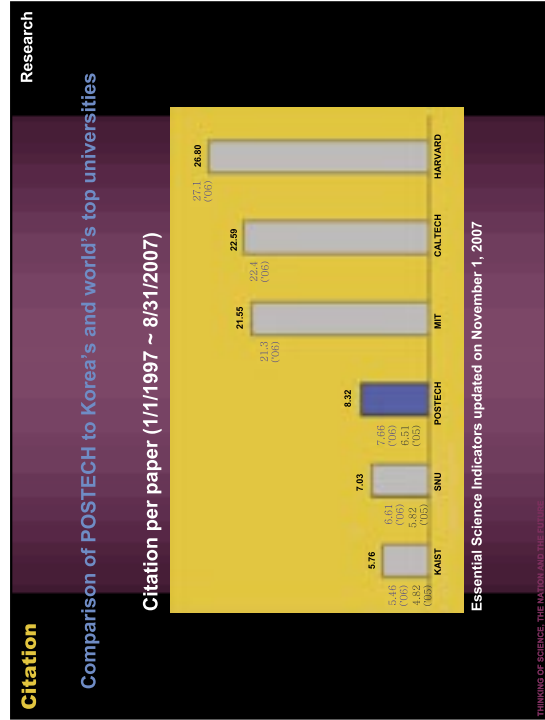
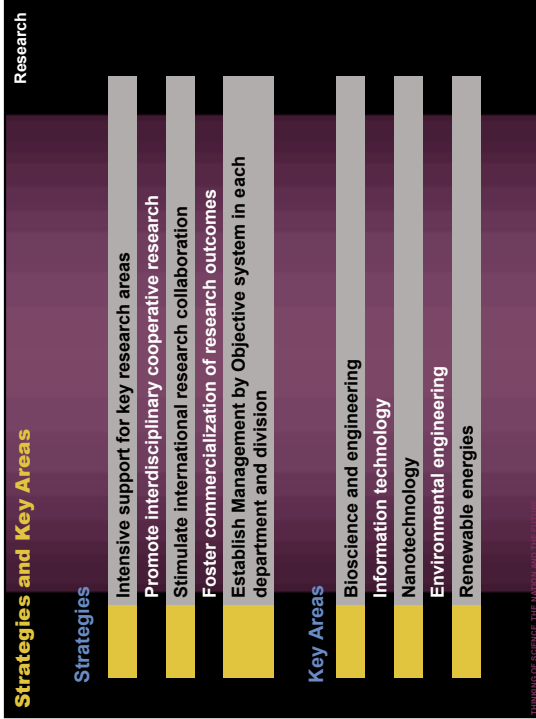
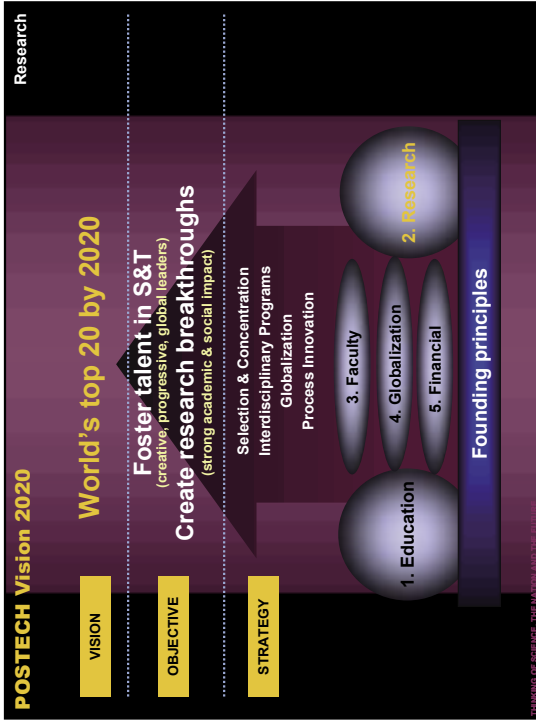
TOP 11 CITATIONS PER FACULTY

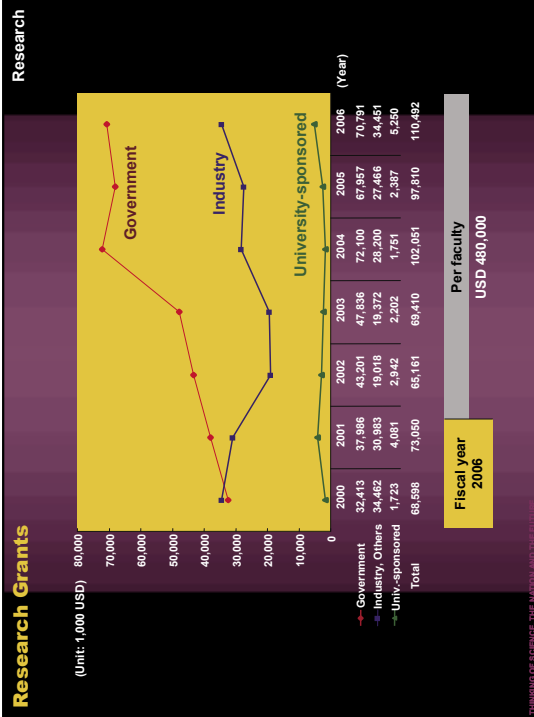
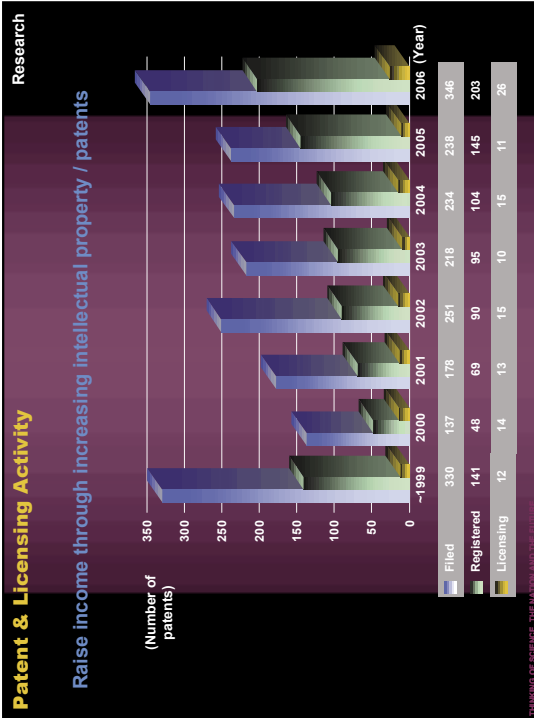
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Infrastructure

Tae-Joon Park Digital Library

- Digitalization/internet DB construction of academic information
- Information hub with cyber function
- Providing an environment for various multimedia utilization

POSTECH Biotechnology Center (PBC)

- Cutting-edge research and education in biotechnology, academia-industry cooperation
- Major research areas: molecular medicine, plant biotechnology, nanobiotechnology, basic sciences & technology

Infrastructure

National Center for Nanomaterials Technology (NCNT)

- Support nanomaterials industrialization
- Establish academy-industry cooperation
- Train manpower in the field of nanomaterials

Pohang Institute of Intelligent Robotics (PIRO)

- Service robot: moving platform, operating, intelligence technology
- Bio-medical robot: cell operating, haptic medical robot, diagnosis robot
- Ocean floor robot: probing, picking minerals

Infrastructure Research

Pohang Accelerator Laboratory (PAL)



Linear accelerator	160m long, 2.5 GeV
Storage ring	2.5 GeV, 12-period Triple Bend Achromat lattice, low emittance third generation machine, 280m in circumference
Beamlines	Operating 23 beamlines
Users	More than 1,000 per year

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Infrastructure Research

POSCO International Center



Overview	<ul style="list-style-type: none"> • Area: 17,032 m² (5 ground, 2 basement levels) • Main facilities: conference area, hotel, dining facilities
Purpose	Host international conferences to promote academic and research collaborations

THINKING OF SCIENCE, THE PAST AND THE FUTURE

International Joint Research Research

Establish international cooperation

- Cutting-edge research (IT, BT, NT, ET) aimed for the global market
- Enhance global competitiveness and build national research infrastructure
- Joint research with research-oriented organizations
- Academy-industry cooperation with companies
- Contribute to Korea's advancement

Recent joint research projects with international organizations

Year	Project No.	Fund	Organization
1999	5	0.82M	Novartis, Chiron, AFOSR, Elkem
2000	5	0.37M	GE, NRL, GM, Elkem
2001	5	0.21M	Oriol, GM, IBM, NRL
2002	3	0.45M	GM, AFOSR
2003	6	0.23M	AOARD, Stanford University, JST
2004	11	0.58M	AFOSR, JST, STREM, FISC
2005	8	0.27M	AFOSR, AOARD, ASAHI, LAM, GM
2006	13	0.99M	GM, MS, Omron, AFOSR, JST

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International Joint Research Research

MPG-APCTP-POSTECH Partnership (1)

Establish partnership on October 2007
Joint research from basic to applied science

POSTECH

Research-oriented university
World-class faculty
State-of-the-art research facilities

MPG

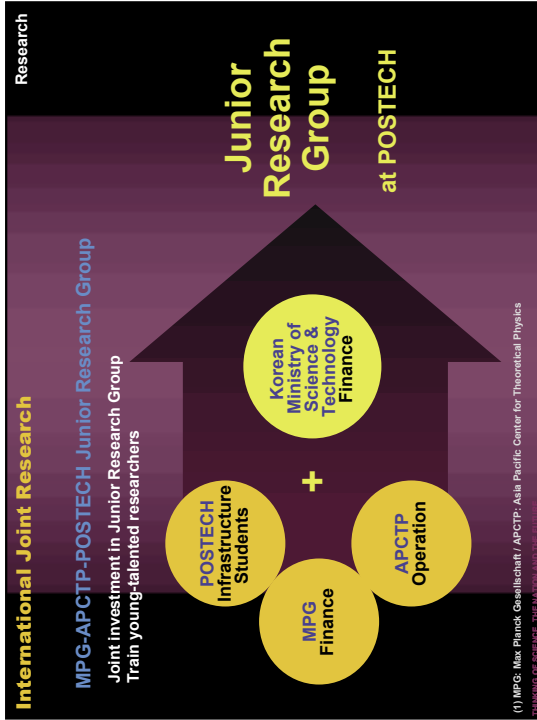
Top research organization
80 institutes
15,000 researchers

APCTP

Leading theoretical physics center
12 member countries
Train young researchers

Research for Future

(1) MPG: Max Planck Gesellschaft / APCTP: Asia Pacific Center for Theoretical Physics
THINKING OF SCIENCE, THE PAST AND THE FUTURE



World-renowned Scholars Lecture Program

Fields medalists, Nobel Laureates and world-renowned scholars
 Lectures, discussions, workshops

Year	Area	Lecturer	Position / Prize
1981	Physics	Norman F. Ramsey	Harvard U / 1989 Nobel Prize (Physics)
1982	Chemistry	Derek Barton	Texas A&M Univ. / 1969 Nobel Prize (Chemistry)
1984	Life Science	Bert Sakmann	Heidelberg U / 1991 Nobel Prize (Medical Science)
1985	Mathematics	John Milnor	New York State U / 1962 Fields Medal
1987	Physics	Ilya Prigogine	Prigogine Center / 1977 Nobel Prize (Chemistry)
1989	Chemistry	Jean Marie Lehn	U of Louis Pasteur / 1987 Nobel Prize (Chemistry)
2001	Mathematics	Efim I. Zelmanov	Yale U / 1994 Fields Medal
2001	Political Science	R. Scalapino	UC Berkeley
2002	Life Science	Paul Greengard	The Rockefeller U / 2000 Nobel Prize (Physiology)
2004	Physics	Robert B. Laughlin	Stanford U / 1998 Nobel Prize (Physics) - POSTECH Chair-Professor
2006	Mathematics	Jean-Christophe Yoccoz	Collège de France / 1994 Fields Medal
2006	Chemistry	Roderick MacKinnon	Rockefeller U / 2003 Nobel Prize (Chemistry)
2007	Life Science	Peter C. Doherty	U of Melbourne / 1986 Nobel Prize (Physiology or Medicine)

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- ### What makes POSTECH?
- 1 First research-oriented university in Korea
 - 2 Small in size but excellence in quality
 - 3 Low faculty to student ratio
 - 4 Highest education investment in Korea
 - 5 Scholarships and/or assistantships for all students
 - 6 Dormitory for all students during their studies
 - 7 Outstanding faculty
 - 8 World-class research achievement
 - 9 Strong academy-industry cooperation
 - 10 Top 1% to 0.1%
- THINKING OF SCIENCE, THE NATION AND THE FUTURE

POSTECH Vision Accomplishment Conclusion

**World-class Research-oriented University
World's Top 20 by 2020**

Best 10 research accomplishments
by year 2010

2006 New Leap (20th Anniversary)

- Selection &
Concentration
- Inter-
disciplinary
Programs
- Globalization
- Process
Innovation

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Q & A www.postech.ac.kr

THANK YOU!

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