# Do You Know Nagoya University? (full version)

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## The City of Nagoya



#### **Outline of Nagoya**

- Population of 2.32 million
- 1 hr 40 m to Tokyo; 30/50 m to Kyoto/Osaka by SHINKANSEN, or bullet trains

#### **Industry**

- Best known as an industrial powerhouse
  - Home of Toyota Motor Corp., Mitsubishi Heavy Ind., etc.





Nagoya Castle Downtown Nagoya

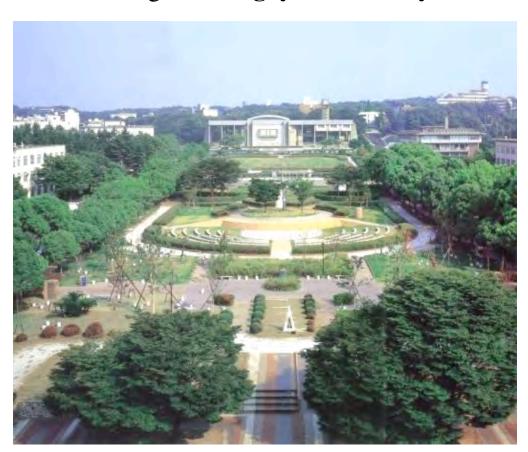




## Nagoya University Overview

#### History

- 1871 Established as a temporary hospital and medical school
- 1939 Established as Nagoya Imperial University
- 1947 Changed to Nagoya University



Main Campus

## 9 Undergraduate and 13 Graduate Schools

Letters (arts, social science & humanities)

**Economics** 

Medicine

Education

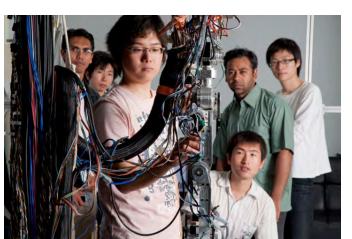
**Information Science** 

Engineering

Law

Science (mathematics & natural science)

**Agricultural Sciences** 



Total Student Population: 16,536

Undergraduate: 10,115

Graduate: 6,272

International Students: 2,289 (May 1, 2018)

## Many Cultural Clubs and Sports Teams (1)



漕艇(ボート)部 [Boat]



バレーボール部 [Volleyball]



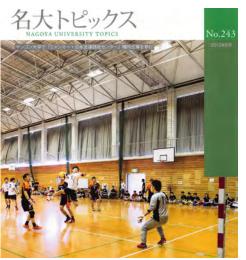
水泳部 [Swimming]



陸上部 [Track and Field]



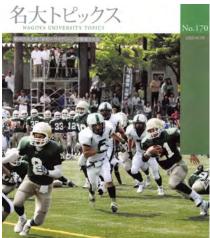
体操部 [Gymnastics]



ハンドボール部 [Handball]



ゴルフ部 [Golf]

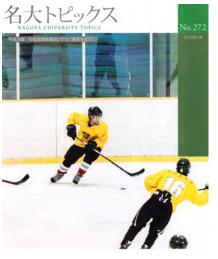


アメリカンフットボール部 [American Football]

## Many Cultural Clubs and Sports Teams (2)



アーチェリー部 [Archery]



アイスホッケー部 [Ice Hockey]



フィギュア スケート部 [Figure Skating]



ラクロス部 [Lacrosse]



フライングディスク部 [Flying Disk]



奇術研究会 [Magic]



劇団新生 [Modern Theatre]

## Many Cultural Clubs and Sports Teams (3)



交響楽団 [Orchestra]



吹奏楽団 [Brass Band]



ギター・マンドリンクラブ



アカペラサークル[A Cappella]



軽音楽部 [Light Music]



フォルクローレ同好会 [Folklore Circle]



混声合唱団 [Mixed Chorus]



民族舞踊団 [Ethnic Dance]

## Many Cultural Clubs and Sports Teams (4)



航空部 [Aeronautics]



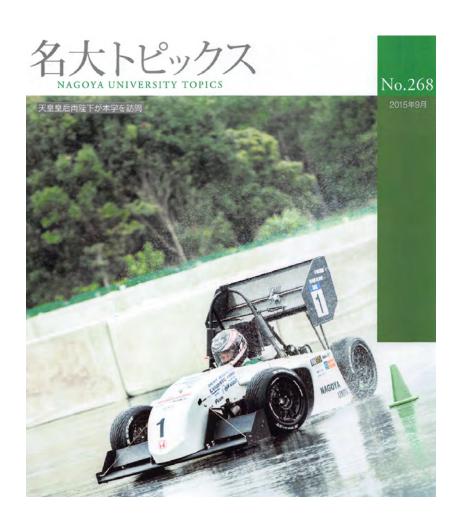
ヨット部 [Sailboat]



人力飛行機制作サークル [Man-Powered Airplane]

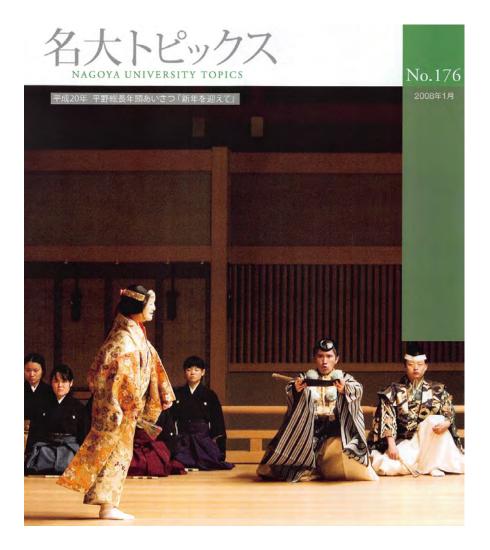


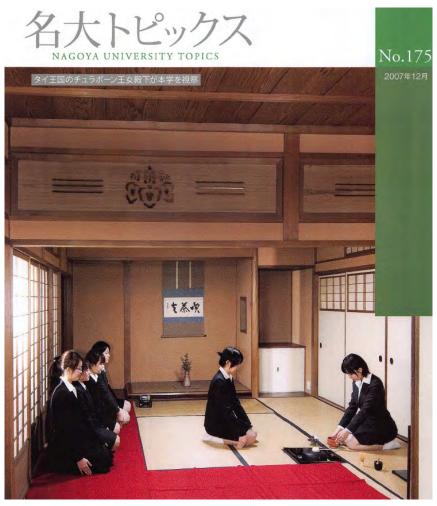
馬術部 [Horseback Riding]



フォーミュラチーム [Formula Racing]

## Many Cultural Clubs and Sports Teams (5)





茶道部 [Tea Ceremony]

## Many Cultural Clubs and Sports Teams (6)





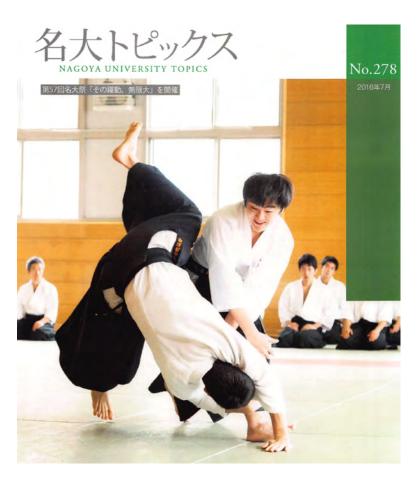
弓道部 [Kyudo]



相撲部 [Sumo]



日本拳法部 [Kempo]



合気道部 [Aikido]

## Many Cultural Clubs and Sports Teams (7)





## Imperial Universities(帝国大学)一最高学府

In 1886 Japanese Government has installed the Imperial University System (first modern university system) in order to educate young students in the European manner and aimed to create elite and leaders of the country. Before that, higher education in Japan meant Chinese Literature education, especially Confucian teaching (孔子).

	Year founded	Imperial University
1	1886	東京(Tokyo)
2	1897	京都(Kyoto)
3	1907	東北(Tohoku)
4	1911	九州(Kyushu)
5	1918	北海道(Hokkaido)
6	1924	京城(Seoul)
7	1928	台北(Taipei)
8	1931	大阪(Osaka)
9	1939	名古屋(Nagoya)

People believe: The older a university is, the more prestigious and better it is. Is it true?

## **How Does Media Report? (1)**

Thomson Reuter (presently, Clarivate Analytics), Japan gave the following ranking according to the total number of citations and announced in media in April (every year).

Cf. http://www.thomsonscientific.jp/news/press/esi2007/ranking.html

Ranking of Japanese Universities Based on Total Numbers of Citations

(1996-2006)

Domestic Ranking	World Rnaking	Universities	No. of Faculty Members*
1	13	Univ. of Tokyo	3969
2	30	Kyoto Univ.	3003
3	34	Osaka Univ.	2458
4	70	Tohoku Univ.	2567
5	99	Nagoya Univ.	1804
6	110	JST	
7	119	Kyushu Univ.	2315
8	140	Hokkaido Univ.	2166
9 159 <b>RIKEN</b>		RIKEN	
10	163	Tokyo Inst. Tech.	1225

<sup>\*</sup> No. of faculty members in 2004: http://www8.cao.go.jp/cstp/siryo/haihu49/siryo2-7.pdf

However, these numbers do not represent the real ranking of research level; they just imply that the number of faculty members is large (hence, the total numbers of papers and citations are large).

## **How Does Media Report? (2)**

Recent reports by Clarivate Analytics (former Thomson Reuter) are based on the number of highly cited papers and released to media in April every year. https://clarivate.jp/news-releases/esi2018

Ranking of Japanese Universities Based on Numbers of Highly Cited Papers (2007-2017)

Domestic Ranking	No. of Highly Cited Papers	Universities	Number of Faculty Members*
1	1338	Univ. of Tokyo	3895
2	818	Kyoto Univ.	3361
3	544	Osaka Univ.	3242
4	513	Tohoku Univ.	3155
5	399	Nagoya Univ.	2367
6	319	Kyushu Univ.	2431
7	302	Tokyo Inst. Tech.	1038
8	264	Hokkaido Univ.	2412
9	249	Univ. of Tsukuba	1893
10	188	Hiroshima Univ.	1678

<sup>\*</sup> No. of faculty members in 2017: http://portal.niad.ac.jp/ptrt/h29.html

Cf. http://www.mext.go.jp/a\_menu/kagaku/sokushinhi/1338460.htm

### **How Does Japanese Government Assess? (1)**

In August, 2013, Ministry of Education, Culture, Sports, Science and Technology (MEXT) has announced to give the following universities special funds to promote research activities.

#### (研究大学強化促進事業)

- \* Annual Budget of 400 Million Yen (4 Universities)

  Kyoto Univ., Tohoku Univ., Nagoya Univ., Univ. of Tokyo
- \* Annual Budget of 300 Million Yen (12 Universities)
  - Osaka Univ., Kyushu Univ., Tokyo Inst. Tech., Univ. of Tsukuba, Hiroshima Univ., Tokyo Medical Dental Univ., Tokyo Univ. of Electro Commun., Nara Inst. Adv. Sci. Tech., Waseda Univ., NINS, KEK, ROIS
- \* Annual Budget of 200 Million Yen (6 Universities) Hokkaido Univ., Kobe Univ., Toyohashi Inst. Tech., Okayama Univ., Kumamoto Univ., Keio Univ.

### How Does Japanese Government Assess? (2)

MEXT chose the following universities as

Designated National Universities (指定国立大学法人)

that should perform education and research at the

highest international level:

Academic Year 2017:

Tohoku Univ., Univ. of Tokyo, Kyoto Univ.,

Tokyo Inst. Tech., Nagoya Univ.

Academic Year 2018:

Osaka Univ.

Academic Year 2019:

Hitotsubashi Univ.

### **How Do International Agencies Evaluate?**

## World Ranking of Universities

- 1. Times Higher Education World University Rankings
- 2. US News Best Global Universities
- 3. QS World University Rankings
- 4. Academic Ranking of World Universities

#### **Times Higher Education World University Rankings 2018**

https://www.timeshighereducation.com/world-university-rankings

#### **World Ranking of Universities**

Nagoya University is ranked No. 301-350 in the World and No. 6 in Japan.

World Ranking	Universities	World Ranking	Universities (Domestic)
1	Univ. of Oxford	46	Univ. of Tokyo
2	Univ. of Cambridge	74	Kyoto Univ.
3	California Inst. of Tech.	201-250	Osaka Univ.
3	Stanford Univ.	201-250	Tohoku Univ.
5	MIT	251-300	Tokyo Inst. Tech.
6	Harvard Univ.	301-350	Nagoya Umiv.
7	Princeton Univ.	351-400	Kyushu Umiv.
8	Imperial College London	401-500	Hokkaido Univ.
9	Univ. of Chicago		
10	ETH Zurich		
10	Univ. of Pennsylvania		
12	Yale Univ.		
13	Johns Hopkins Univ.		
14	Columbia Univ.		

#### **US News Best Global Universities**

https://www.usnews.com/education/best-global-universities/rankings

#### **World Ranking of Universities**

Nagoya University is ranked No. 247 in the World and No. 5 in Japan.

World Ranking	Universities	World Ranking	Universities (Domestic)
1	Harvard Univ.	57	Univ. of Tokyo
2	MIT	114	Kyoto Univ.
3	Stanford Univ.	194	Osaka Univ.
4	UC Berkeley	204	Tohoku Univ.
5	Univ. of Oxford	247	Nagoya Univ.
6	California Inst. of Technology	281	Tokyo Inst. Tech.
7	Univ. of Cambridge	316	Kyushu Univ.
8	Columbia Univ.	357	Waseda Univ.
9	Princeton Univ.	363	Tsukuba Univ.
10	Johns Hopkins Univ.	370	Hokkaido Unov.
10	Univ. Washington	466	Keio Univ.
10	Yale Univ.		

#### **QS World University Rankings 2018**

https://www.topuniversities.com/university-rankings/world-university-rankings/2018

#### **World Ranking of Universities**

Nagoya University is ranked No. 116 in the World and No. 6 in Japan.

World Ranking	Universities	World Ranking	Universities (Domestic)
1	MIT	28	Univ. of Tokyo
2	Stanford Univ.	36	Kyoto Univ.
3	Harvard Univ.	56	Tokyo Inst. Tech.
4	California Inst. of Technology	63	Osaka Univ.
5	Univ. of Cambridge	76	Tohoku Univ.
6	Univ. of Oxford	116	Nagoya Univ.
7	Univ. College London	122	Hokkaido Univ.
8	Imperial College London	128	Kyushu Univ.
9	Univ. of Chicago	192	Keio Univ.
10	ETH Zurich	203	Waseda Univ.
11	Nanyang Tech. Univ., Singapore		
12	Ecole Polytech. Feder. Lausanne		
13	Princeton Univ.		
14	Cornell Univ.		

#### **Academic Ranking of World Universities 2017**

http://www.shanghairanking.com

#### **World Ranking of Universities**

Nagoya University is ranked No. 84 in the World and No. 3 in Japan.

World Ranking	Universities	World Ranking	Universities (Domestic)
1	Harvard Univ.	24	Univ. of Tokyo
2	Stanford Univ.	35	Kyoto Univ.
3	Univ. of Cambridge	84	Nagoya Univ.
4	MIT	101-150	Osaka Univ.
5	UC Berkeley	101-150	Tohoku Univ.
6	Princeton Univ.	151-200	Hokkaido Univ.
7	Univ. of Oxford	151-200	Tokyo Inst. Tech.
8	Columbia Univ.	201-300	Kyushu Univ.
9	California Inst. of Technology	201-300	Univ. of Tsukuba
10	Univ. of Chicago	301-400	Chiba Univ.
11	Yale Univ.		
12	UCLA		
13	Univ. of Washington		
14	Cornell Univ.		

#### **Academic Ranking of World Universities 2017**

http://www.shanghairanking.com

#### **World Ranking of Universities in Physics**

http://www.shanghairanking.com/Shanghairanking-Subject-Rankings/physics.html Nagoya University is ranked No. 17 in the World and No. 2 in Japan.

World Ranking	Universities	World Ranking	Universities
1	MIT	17	Nagoya Univ.
2	UC Berkeley	18	Univ. of Cambridge
3	Univ. of Tokyo	19	Univ. of Oxford
4	Univ. of Chicago	20	Univ. libre de Bruxelles
5	Harvard Univ.	21	Columbia Univ.
6	Princeton Univ.	22	UC Irvine
7	Stanford Univ.	23	Univ. of Munich
8	California Inst. of Technology	24	Kyoto Univ.
9	UC Santa Barbara	25	Johns Hopkins Univ.
10	Univ. of Colorado at Boulder	26	Univ. of Maryland
11	Univ. of Manchester	27	Univ. Paris Diderot
12	Univ. of Paris-Sud	28	Univ. Grenoble Alpes
13	Pierre and Marie Curie Univ.	29	Sapienza Univ. of Rome
14	Univ. of Edinburgh	29	Univ. of Pennsylvania
15	Cornell Univ.	31	Imperial College of
16	U. of Illinois at Urbana-Champaign		Science, Tech. Medicine

Japan has only 23 Nobel Laureates in Science and 3 Fields Medalists

Our Professors (for the works done at Nagoya Univ.)

- \* Shigefumi MORI (1990 Fields Medal: "for Minimal Model Program in connection with the classification problems of algebraic varieties of dimension three")
- \* Ryoji NOYORI (2001 Nobel Prize in Chemistry: "for work on chirally catalysed hydrogenation reactions")
- \* Isamu AKASAKI (2014 Nobel Prize in Physics: "for the invention of Blue Light Emitting Diode")

As far as I know, Nagoya University is the only university in Asia where the prize-winning works for both Nobel Prize and Fields

Medal were performed.







Japan has only 23 Nobel Laureates in Science and 3 Fields Medalists

Our Former Students (and Professors)

- \* Osamu SHIMOMURA (2008 Nobel Prize in Chemistry: "for the discovery of the green fluorescent protein, GFP ")
- \* Makoto KOBAYASHI (2008 Nobel Prize in Physics: "for the discovery of the origin of the broken symmetry which predicts the existence of at least three families of quarks in nature")
- \* Toshihide MASKAWA (2008 Nobel Prize in Physics: "for the discovery of the origin of the broken symmetry which predicts the existence of at least three families of quarks in nature")
- \* Hiroshi AMANO (2014 Nobel Prize in Physics: "for the invention of Blue Light Emitting Diode")











## ← Newton's Apple Tree in Cambridge

## Newton's Apple Tree → in Nagoya University

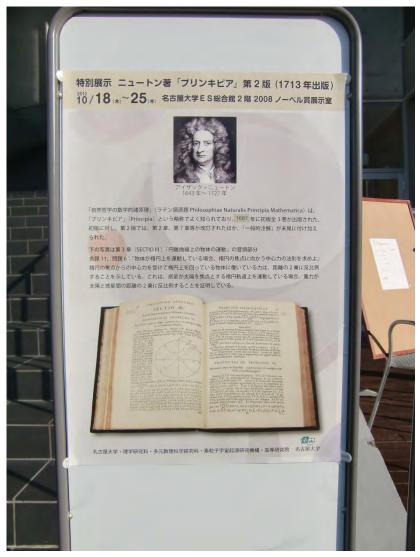
In 1964, a descendant of Newton's Apple Tree was sent to Professor Yuji Shibata, the director of Japan Academy and the first Dean (1942-1948) of School of Science, Nagoya University. It has been nursed at Koishikawa Botanical Garden in Tokyo and came to Nagoya to celebrate the Nobel Prizes of two alumni of the School 47 years later.

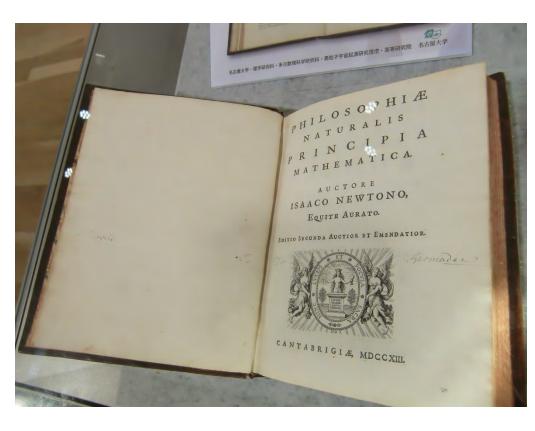


#### Newton's Apple Tree in Nagoya University: 4 July, 2018



## Our Library bought a second (1713) edition of Newton's PRINCIPIA





#### No. of Nobel Laureates for Science from Japan (No. of Fields Medalists)

	Univ. where prize-winning works done	Degree granting univ.	Univ. when awarded
Kyoto Univ	5 [Fukui, Kobayashi, Maskawa, Yamanaka, Honjo]	8(2) [Yukawa, Tomonaga, Fukui, Tonegawa, Noyori, Akasaki, Honjo, Yoshino (Hironaka, Mori)]	<b>3(1)</b> [Fukui, Yamanaka, Honjo (Mori)]
Nagoya Univ.	3(1) [Noyori, Akasaki, Amano (Mori)]	5 [Kobayashi, Maskawa, Shimomura, Akasaki, Amano]	2 [Noyori, Amano]
Univ. of Tokyo	3 [Koshiba, Kajita, Ohsumi]	<b>8(1)</b> [Tomonaga, Esaki, Koshiba, Nanbu, Negishi, Omura, Kajita, Ohsumi (Kodaira)]	<b>1</b> [Kajita]
Osaka Univ.	1 [Yukawa]	2 [Yukawa, Yoshino]	0
Tokyo Inst. Tech.	1 [Shirakawa]	1 [Shirakawa]	1 [Ohsumi]
Hokkaido Univ.	1 [Suzuki]	1 [Suzuki]	0
Univ. of Tsukuba	1 [Tomonaga]	0	1 [Tomonaga]
Kitasato Univ.	1 [Omura]	0	1 [Omura]
Nara Inst. Sci. Tech.	1 [Yamanaka]	0	0
Natl Inst. Basic Biol.	1 [Ohsumi]	0	0
Tohoku Univ.	0	1 [Tanaka]	0
Nagasaki Univ.	0	1 [Shimomura]	0
Kobe Univ.	0	1 [Yamanaka]	0
Osaka City Univ.	0	1 [Yamanaka]	0
Tokushima Univ.	0	1 [Nakamura]	0
Tokyo Univ. of Sci.	0	1 [Omura]	0
Yamanashi Univ.	0	1 [Omura]	0
Saitama Univ.	0	1 [Kajita]	0
Meijo Univ.	0	0	2 [Akasaki, Yoshino]
Kyoto Sangyo Univ.	0	0	1 [Maskawa]

Some of Outstanding Former Students and Professors of Physics Department at Nagoya University

https://www.phys.nagoya-u.ac.jp/en/study/ach.html

1. Particle Physics

#### \* Shoichi SAKATA

has proposed the "Sakata Model", a forerunner of the quark model, and has discovered the "Maki-Nakagawa-Sakata Matrix", which has predicted neutrino oscillations.

\* Makoto KOBAYASHI and Toshihide MASKAWA

have discovered the "Kobayashi-Maskawa Matrix", which predicted the existence of a third generation of quarks and explained

the mechanism for CP violation.

#### \* Kimio NIWA

has developed a full-automatic nuclear emulsion read-out system and has discovered the tau neutrino.



## Some of Outstanding Former Students and Professors of Physics Department at Nagoya University

https://www.phys.nagoya-u.ac.jp/en/study/ach.html

#### 2. Astrophysics and General Relativity

\* Satio HAYAKAWA

has started space astronomy research in Japan with X-ray and infrared observations, including the first rocket observation of cosmic X-rays.



\* Yasuo TANAKA

has led Japanese X-ray astronomy research to the first class in the world with many X-ray missions.

\* Akira TOMIMATSU

has discovered the "Tomimatsu-Sato Solution", which is one of the exact solutions to the Einstein Equation in the General Theory of Relativity. Some of Outstanding Former Students and Professors of Physics Department at Nagoya University <a href="https://www.phys.nagoya-u.ac.jp/en/study/ach.html">https://www.phys.nagoya-u.ac.jp/en/study/ach.html</a>

### 3. Condensed Matter Physics

- \* Ryozi UYEDA
  has pioneered in the world the development of a
  reflection high-energy electron diffraction device
  featuring a vacuum evaporator and has also
  - become a pioneer in Japan's nanoscience research with his works on superfine particles.
- \* Tadao KASUYA and Kei YOSIDA
  have discovered the "Ruderman-KittelKasuya-Yosida (RKKY) Interaction",
  which is a long-distance interaction between
  localized spins existing in different sites of metal.
- \* Huzio NAKANO
  has discovered the "Nakano-Green-Kubo Formula"

for electric conductivity, which is one of the bases for non-equilibrium statistical mechanics.





## Some of Outstanding Former Students and Professors of Physics Department at Nagoya University

https://www.phys.nagoya-u.ac.jp/en/study/ach.html

### 4. Biophysics

\* Fumio OOSAWA

has discovered the "Asakura-Oosawa Theory" on depletion forces, has started biophysics research in Japan, and has played a major role in the inauguration of the Biophysical Society of Japan.

#### \* Sho ASAKURA

has discovered the "Asakura-Oosawa Theory" on depletion forces and has also succeeded in in-vitro reconstruction of bacterial flagella, elucidating the mechanism of flagella formation.





#### **Employment Rates of Former Imperial University Students**

\*大学別実就職率(2018年卒) [Employment rate (2018 grads)]

- 1. Nagoya University 91.9 %
- 2. Osaka University 85.2
- 3. Tohoku University 84.2
- 4. Hokkaido University 82.4
- 5. Kyushu University 81.3 (「本当に就職に強い大学ランキング」
- 6. Kyoto University 78.0 東洋経済(2018年)

(Data not available for University of Tokyo at the time of publication)

#### \*有名企業400社への実就職率(2017年卒)

[Employment rate for 400 famous companies (2017 grads)]

- 1. Osaka University 35.5 %
- 2. Nagoya University 34.3
- 3. Kyoto University 32.4
- 4. University of Tokyo 28.2
- 5. Kyushu University 27.0
- 6. Tohoku University 24.7
- 7. Hokkaido University 23.8 (東洋経済ONLINE2017年9月8日)

Nagoya University Global 30 International Programs http://admissions.g30.nagoya-u.ac.jp/en/

With these new undergraduate and graduate programs, we give lectures all in English and accept students from abroad.

One of the most attractive and successful international programs in Japan.



## G30 Undergraduate Programs

#### Automotive Engineering

• School of Engineering (Mech/Elec)

#### Chemistry

- School of Science
- School of Engineering

#### Biological Sciences

- School of Science
- School of Agricultural Science

## Fundamental (and Applied) Physics

- School of Science
- (School of Engineering)

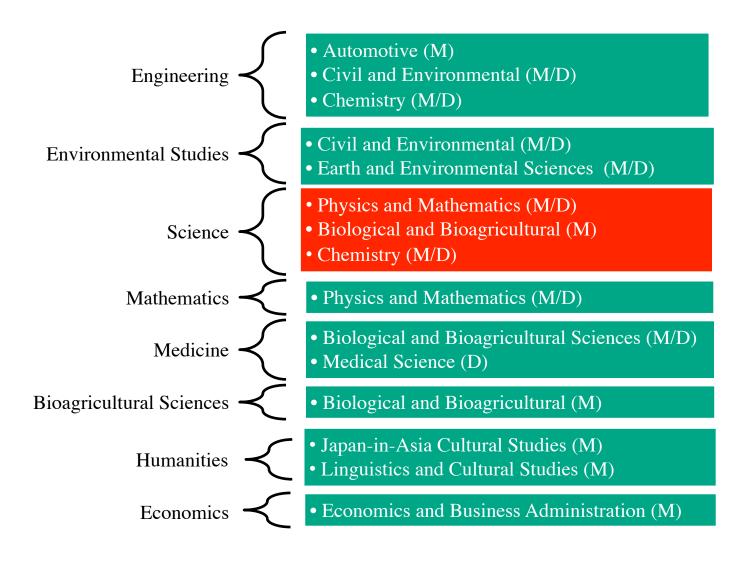
#### Social Sciences

- School of Law
- School of Economics

#### Japan-in-Asia Cultural Studies

• School of Humanities

## G30 Graduate Programs



Nagoya University Global 30 International Programs http://admissions.g30.nagoya-u.ac.jp/en/

One of the most attractive and successful international programs in Japan.

Our G30 program is attractive because we cover many different subjects/fields.

Our G30 program is successful; e.g., our undergraduate students are getting in graduate schools in top universities in the World such as University of Cambridge, University of Oxford, MIT, University of California at Berkeley, etc.

## Nagoya University is doing well not only in academia but also in other fields.

Olympian: Ayuko SUZUKI (graduated in 2014; economics)

2013: Gold Medal in Women's 10000 m run and Bronze Medal in Women's 5000 m run in Summer Universiade in Russia

2016: Represented Japan for Women's 5000 m and 10000 m

runs in Rio de Janeiro Summer Olympics (the first woman Olympian among the alumni of former imperial universities)

2020: Representing Japan for Women's marathon in Tokyo Summer Olympics (which was postponed to 2021)



### Nagoya University is doing well not only in academia but also in other fields.

Professional Japanese Chess (SHOGI) Player: Sota FUJII (was a 2nd year student at Nagoya University Junior High School when he became professional)

Oct. 1, 2016: Became professional at the age of 14 years and 2 months old

(the youngest record; the previous record was 14 years and 7 months old recorded 62 years before) **June 26, 2017**: 29 consecutive wins (7.9 M views on live net TV) from the beginning of his professional career (new record; the previous record of consecutive victories was 28 in 1986-87. He finally lost on July 2, 2017.)

July 16, 2020: Youngest major title holder

(17 years and 11 months old; the previous record was 18 years and 6 months old recorded 30 years before) [Cf. There are 8 major titles.]