



Chemical Education

Inspiring Chemical Education

Ice

Iceberg

Ice flow

Mars

Chemistry Teacher
Nobel laureates
Computer
Internet

Earth

Moon

Crystal structure
















Ice-5. Nobel Laureates of 2016

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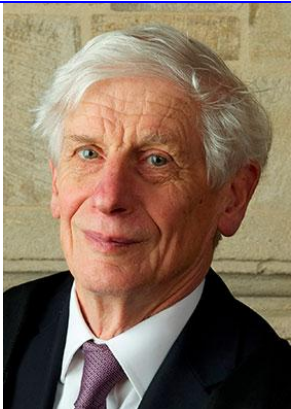













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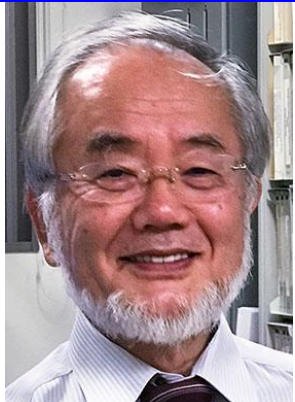



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Nobel prizes had been given to research scientists in Physics, chemistry, physiology or medicine since 1901 in recognition of their contributions serving the cause of 'benefit to mankind'. The other disciplines in the Nobel Prize category are literature, peace and economics. Alfred Nobel was a Swedish chemist and engineer born in 1833 in Stockholm. He spent most of his career in researching with explosives mainly nitroglycerine and had 355 patents of different countries. Nobel established trust for noble prizes in 1885 with his personnel property worth approximately 265 million USD today. [Table 1](#) describes focal theme of research, country/year of birth, affiliation of institute at the time of award of Nobel Prize winners of 2016.

Let knowledge shower from all sides					
Table 1: Nobel Prize awards of 2016					
Nobel Laureate in 2016	Prize share	Focal theme	Chemistry	Affiliation	Year and place of birth
Jean-Pierre Sauvage	1/3	 Design and synthesis of molecular machines		 University of Strasbourg, Strasbourg, France	 1944,  Paris, France
Sir J. Fraser Stoddart	1/3	 Design and synthesis of molecular machines		 Northwestern University, Evanston, IL, USA	 1942  Edinburgh, United Kingdom
Bernard L. Feringa	1/3	 Design and synthesis of molecular machines		 University of Groningen, Groningen, the Netherlands	 1951  Barger-Compascuum, the Netherlands





A common man's perspective of chemistry is through vivid color changes (save rainbow), copious precipitation and evolution of pungent gases. A little scientific perspective opens the window of making or breaking of covalent/co-ordinate bonds in chemical systems. Non-covalent interactions viz. ion-ion, ion-multipole, multipole-multipole, hydrogen/halogen bonds, stacking interactions, induced multipole-multipole and dispersion play a significant role in chemical/biological/atmospheric processes including those at interfaces. Mechanical bonds now entered the bandwagon and opens new vistas in chemical world.

Nobel Laureates in 2016	Prize share	Focal theme	Physics	Affiliation	Year and place of birth
 David J. Thouless	1/2	 Theoretical discoveries of topological phase transitions and topological phases of matter		 University of Washington, Seattle, WA, USA	 1934  Bearsden, United Kingdom
 F. Duncan M. Haldane	1/4			 Princeton University, Princeton, NJ, USA	 1951,  London, United Kingdom
 J. Michael Kosterlitz	1/4			 Brown University, Providence, RI, USA	 1942,  Aberdeen, United Kingdom

Nobel Laureate in 2016	Prize share	Focal theme	Physiology or Medicine	Affiliation	Year and place of birth
 Yoshinori Ohsumi	1/1	 Discoveries of mechanisms for autophagy		 Tokyo Institute of Technology, Tokyo, Japan	 1945  Fukuoka, Japan

Sveriges Riksbank Prize of 2016	Prize share	Focal theme	Economic Sciences	Affiliation	Year and place of birth
 Oliver Hart	1/2	 Contract theory		 Harvard University, Cambridge, MA, USA	 9 October 1948,  London, United Kingdom
 Bengt Holmström	1/2	 Contract theory		 Massachusetts Institute of Technology (MIT), Cambridge, MA, USA	 18 April 1949,  Helsinki, Finland

Nobel Laureate in 2016	Prize share	Focal theme	Literature	Year and place of birth
 Bob Dylan	1/1	 New poetic expressions within American song tradition		 24 May 1941,  Duluth, MN, USA

Nobel Laureate in 2016	Prize share	Focal theme	Peace	Role	Year and place of birth
 Juan Manuel Santos	1/1	 Resolute efforts to bring the country's more than 50-year-long civil war to an end		 President of Colombia	 1951  Bogotá, Colombia

Knowledge growth from more to more enriches human life

Information source: <http://www.nobelprize.org/>

Education system is an ever evolving interwoven hub of multitude of aims, objectives and goals. They in turn are hierarchical in nature with local, regional and global building blocks in short/long/distant future time frames. The skills, knowledge, mindset, intelligence of learners grow/refine/modify in the learning castles with ivory towers, of course, resting on firm/dwindling chassis with load bearing pillars viz. teachers, mentors, fiscal infra-structure and past/present/future learners. The staircases, elevators, tele transportation from ground floor (schooling) to sky scraper levels depend upon continuing trodden path /exploring newer ones targeted for horizontal/vertical/zig-zag expansion and/or quantum jumps. In reality, there are hurdles, dead ends, path diverters as one progresses through under-graduation, graduation, profession, research training, post-doc experience, individual/employer/trusted/ research directions, etc. The co-learners/inspirers and primarily the individual's effort/persistence enhance the discrimination capacity, vivid analysis of truth and false values of every/anything.

Sometimes, opportunities knocking the door-steps/ sought after sub-goals and choices alter the path. Grabbing opportunities, looking up in the sky, deep into ocean bed/mantle of earth,

leaving aside planet of diamonds for grace, aspiring for best of best etc. are 'like take care of pence and pounds will automatically take care of themselves'. This proverb also should be critically understood with its innate truth value as 'concentrate on effort in each micro-time interval and cumulative effects will result in much bigger (thriceif not tens of ordersor even tenfoldmagnitude) realizations undreamt/unasked. [Table 2](#) describes information about the number of Noble Laureates in each discipline and single scientists' winning the coveted prize. The families of Curie couples and others with their blood relatives who won Nobel Prize are incorporated in [table 3](#).

Table 2: Nobel Laureates since 1901

Discipline	#NLs	#NPs awarded to single Scientist	# NPs
Physics	204	47	110
Chemistry	175	63	108
Medicine	211	39	107
Literature	113	105	109
Peace	104+26	66	97
Economics	78	24	48
Total:	911	344	579

Table 3a: Curie couples in the family

Married couples	Year	NP in
☞ Marie Curie ☞ Pierre Curie	1903	Physics
☞ Marie Curie	1911	Chemistry
☞ Irène Joliot-Curie ☞ Frédéric Joliot	1935	Chemistry

Table 3b: Married couples --Nobel Prizewinners

Married couples	NP in	Year
☞ Alva Myrdal ☞ Gunnar Myrdal	Peace Economics	1982 1974
☞ Gerty Cori ☞ Carl Cori	Medicine	1947
☞ May-Britt Moser ☞ Edvard I. Moser	Medicine	2014

Table 3c: Blood relatives in Nobel Laureate family

Father & son	NP in	Year
☞ William Bragg ☞ Lawrence Bragg	Physics	1915
☞ Arthur Kornberg ☞ Roger D. Kornberg	Medicine Chemistry	1959 2006
☞ Niels Bohr ☞ Aage N. Bohr	Physics Physics	1922 1975
☞ Manne Siegbahn ☞ Kai M. Siegbahn	Physics Physics	1924 1981
☞ Hans von Euler-Chelpin ☞ Ulf von Euler	Chemistry Medicine	1929 1970
☞ Joseph John Thomson ☞ George Paget Thomson	Physics Physics	1906 1937
Brothers		
☞ Jan Tinbergen ☞ Nikolaas Tinbergen	Economics Medicine	1969 1973