An analytical study of field medal in mathematics with special references upto 20th century

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Abstract:

The purpose of this paper is to highlight the work in pure mathematics and the importance of the mathematics research and new discoveries in the abstract theory of mathematics . The mathematics Prize called the field medal and its history of the field medal with the current status of this award. Also analyze the mathematical work for which the field medal was awarded.

Key Words: Mathematics Prize , Field Medal , Topology , Algebraic Geometry

Introduction:

Founder of the prize, John Charles Fields, considered two fundamental principles for the award:(a) the solution of a difficult problem and (b) the creation of a new theory enlarging the fields of applications of mathematics. Both these principles are important for the development of mathematics. It is quite clear that they are not independent. Very often the solution of a concrete difficult problem is based on the creation of a new mathematical theory and, conversely, the creation of a new theory may lead to the solution of an old classical problem.

The Fields Medal is now indisputably the best known and most influential award in mathematics. Sometimes it is compared with the Nobel prize, since there is no Nobel prize for mathematics. Publishers and journalists especially like this comparison. It seems to me that such a comparison is not adequate. The Fields medal was established on different principles. Unlike the Nobel prize, which is mostly awarded to mature scientists to crown their careers, the Fields medal is awarded to young scientists, less than 40 years old.

Journey of The Field Medal

The prize is intended not only to recognize results already obtained, but also to stimulate further research. Besides this it is awarded only every four years.

at the International Mathematical Congress. The first Fields Medal was awarded in 1936 in Oslo and the second one 14 years later, the first Fields Medal was awarded in 1936, and the next one in 1950, so with one exception the medals are connected with the second half of the 20th century. The second world war greatly affected the development of society and science in general, mathematics especially. The development of mathematics is a good illustration of the more general thesis about the continuous but "nondifferentiable" nature of the development of science. If we consider the graph of the development of mathematics, we evidently see the changes .

Conditions of the Award :

The Fields Medal has for a long time been regarded as the most prestigious award in the field of mathematics and is often described as a nobel prize of Mathematics. Unlike the Nobel Prize, the Fields Medal is only awarded every four years. The Fields Medal also has an age limit: a recipient must be under age 40 on 1 January of the year in which the medal is

awarded. The under-40 rule is based on Fields's desire that "while it was in recognition of work already done, it was at the same time intended to be an encouragement for further achievement on the part of the recipients and a stimulus to renewed effort on the part of others." Moreover, an individual can only be awarded one Fields Medal; winners are ineligible to be awarded future medals.

Structure of Field Medal .

Fields Medal

The obverse of the Fields Medal

The reverse of the Fields Medal

The medal was designed by Canadian Sculptor **R**. **Tait Mckenzie** . It is made up of **14KT** gold , has a diameter of 63.5 mm , and weighs 169 g.

On the Obverse is **Archimedes** and a Quote attributed to 1st Century AD Poet Manilius.

On the reverse is the inscription (in Latin)
CONGREGATI
EX TOTO ORBE
MATHEMATICI
OB SCRIPTA INSIGNIA
TRIBUERE

Translation - :
“**Mathematician gathered from entire world have awarded for outstanding writing**”

List of Field Medal Award Winner

sr.no	Year	Field Medal Winner	University	Work
1	1936	Lars Ahlfors	University of Helsinki,Finland	Research on covering surfaces related to Riemann surfaces
2	1936	Jesse Douglas	Massachusetts Institute of Technology, US	Did important work on the plateau problem which is concerned with finding minimal surface connecting and

				determined by some fixed boundary."
3	1950	Laurent Schwartz Atle Selberg	University of Nancy , France Institute for Advanced Study, US	Developed the theory of distribution Developed generalization of sieve methods of viggo Brun , results on zeros of Riemann Zeta function
4	1954	Kunihiko Kodaira Jean-Pierre Serre	Princeton University US University of Nancy , France	"Achieved major results in the theory of harmonic integrals and numerous applications to Kählerian and more specifically to algebraic Achieved major result on the homotopy groups of spheres
5	1958	Klaus Roth Rene Thom	University college London,UK University of Strasbourg, france	For solving famous problem of number theory determination of the exact exponent in the Thue-Siegel Inequality Topology of differentiable manifolds
6	1962	Lars Hormander John Milnor	University of Stockholm, sweden Princeton university,US	General theory of linear differential operator Differential topology 7-dimensional sphere
7	1966	Paul cohen Alexander Grothendieck Stephen smale Michael Atiyah	Stanford University , US France University of California University of Oxford , US	Generalized continuum hypothesis Effected fundamental advances in algebraic geometry. Differential Topology Index Theorem of elliptic operator
8	1970	Alan Baker Heisuke Hironaka Sergei Novikov	University of Cambridge ,UK Harvard University , UK Moscow State	Solution to Hilbert's seventh problem Generalized work of zariski The topological invariance
		John G. Thompson	university University of Cambridge ,UK	of pontryagin classes of differential manifold Prove all non cyclic finite simple groups have even order.

9	1974	Enrico Bombieri David Mumford	University of Pisa,Italy Harvard University	Major contribution in the primes in Univalent functions Problem of existence and structure of varieties of moduli
10	1978	Pierre Deligne Charles Fefferman Grigory Margulis Daniel Quillen	Institute of Advance Study,US Princeton University,US Yale University,US University of Oxford,UK	Gave the solution of the three weil conjectures Multidimensional complex Analysis Lie group Algebraic K-Theory
11	1982	Alain Connes William Thurston Shing-Tung Yau	France Cornell University,US Institute of Advance Study,US	Theory of Operator algebras Revolutionized Study of Topology in 2 and 3 dimension Calabi Conjecture in Algebraic Geometry
12	1986	Simon D Gerd Faltings Michael Freedman	Oxford ,UK Princeton University ,US University of California	Topology of four-manifold Prof of the Mordell Conjecture Developed new methods for topological analysis of four manifolds
13	1990	Vladimir Drinfeld Vaughan Jones Shigenfumi Mori Edward witten	University of Chicago University of california Kyoto university,Japan Institute of Advance Study,US	Langland program and quantum group Von neumann algebras and geometric topology Algebraic geometry Application of physical insight leading to new and deep mathematical theorem
14	1998	Richard Borcherds Timothy Gowers Maxim Kontsevich Curtis T. McMullen	University of california Cambride,UK Rutgers University Harvard University , US	For the Contribution to Algebra the theory of automorphic forms Functional Analysis and Combinatorics Algebraic Geometry Theory of Holomorphic Dynamic

Conclusion –

In this paper I observed that most of the mathematicians that win a field medal are working on Algebraic Geometry and Topology . They made very significant and valuable contributions over the 20th century in the field of mathematics. Give more and more opportunities to further study in this World of mathematics. Up to the end of the 20th century no Indian Mathematician Getting this Award .

One important thing i observer is that all the field medal winners are men , No female mathematician got this field medal at least upto 20th century . Apart from that there are many areas like graph theory , Number theory , Differential Equations fuzzy theory. etc are having better opportunities for research and getting field medal.

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