

C R Rao will Receive the 2023 International Prize in Statistics

Why in News?

Calayampudi Radhakrishna Rao, a prominent Indian-American mathematician and statistician, will be awarded the 2023 International Prize in Statistics, the equivalent of a Nobel Prize in the field.

What are the Works of C R Rao?

- Background:
 - Rao's remarkable paper, published in 1945 in the Bulletin of the Calcutta Mathematical Society, demonstrated three fundamental results that paved the way for the modern field of statistics and provided statistical tools heavily used in science today.
- Theory:
 - The Cramer-Rao Lower Bound:
 - Provides a means of **knowing** when a method for **estimating a quantity** is as good as any method can be.
 - The Rao-Blackwell Theorem:
 - Provides a means of **transforming** an estimate into an **optimal estimate.**Together, these results form a foundation on which much of statistics is built.
 - The Information Geometry:
 - Provided insights that **pioneered a new interdisciplinary field** that has flourished as **"information geometry.**
 - Information geometry is the study of the geometrical structure of families of probability distributions.

What is the Significance of Rao's Contribution?

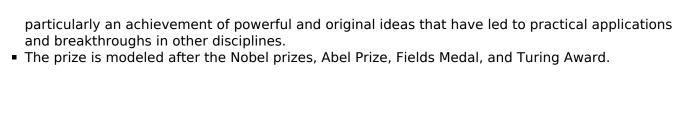
- His work on information geometry has aided the understanding and optimization of Higgs boson measurements at the <u>Large Hadron Collider</u>, and contributed to advancements in <u>artificial</u> <u>intelligence</u>, <u>data science</u>, signal processing, shape classification, and image segregation.
- **The Rao-Blackwell process** has been applied to stereology, particle filtering, and computational econometrics, among others.
- **The Cramer-Rao lower bound** is of great importance in diverse fields such as signal processing, spectroscopy, radar systems, multiple image radiography, risk analysis, and **quantum physics**.

What Other Awards Conferred to C R Rao?

- Padma Bhushan in1968.
- Padma Vibhushan in 2001.

International Prize in Statistics

- The International Prize in Statistics is awarded every two years by a collaboration among five leading international statistics organizations.
- The prize recognizes a major achievement by an individual or team in the statistics field,



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