Excellencies, Mr. President, Dear Colleagues, Ladies and Gentlemen, Dear Lennart,

It's really a great pleasure for me to have the honour to present Professor Lennart Lindegren, before he is awarded the title of Dr. Honoris Causa of Observatoire de Paris. I know Lennart from over 30 years and I am still often amazed by this unique combination of such a creativity and analytical capacity associated with a rare modesty.

Lennart Lindegren is Professor at Lund University and member of the Royal Swedish Academy of Sciences. He was a member of the Hipparcos Science Team from of its first to its last meeting. He was a member of the "Gaia Science Advisory Group" and is now member of the "Gaia Science Team". He has had numerous national and international responsibilities. Mention may be made of Director of the Observatory of Lund, Dean for Graduate Studies in Astronomy and Astrophysics at the University of Lund, Team Leader of one of the Hipparcos Consortia, Coordinator of the European Network ELSA ... He also supervised very many students.

Lennart Lindegren had an absolutely critical role in the Hipparcos mission of the European Space Agency. First, during the first month (I say: month!) of his PhD thesis, and without any preliminary study from which he could have been inspired, he imagined an elegant method, rigorous and effective, to obtain rigidly connected astrometric parameters from the one-dimensional observations obtained by a satellite scanning the sky continuously. This was his first technical note for Hipparcos. It is dated 19 October 1976: "A three-step solution". This method was later used by the two Consortia in charge of the Hipparcos data analysis. He also played a key role in many studies demonstrating the feasibility of the instrument, or leading to its optimization: optimization of the parameters defining the grid modulating the light in the focal plane of the Hipparcos telescope (period and width of the slits), proposal (accepted) of a non-periodic grid for the Tycho experiment, using the Star Mappers of the satellite, design of the relay optics (he had understood that the diffracted light was not modulated by the grid, and that it was therefore unnecessary to increase the size of the relay optics), optimization of the sky scanning law, etc.: over 200 Hipparcos technical notes.

During the Hipparcos feasibility study, at a time when industry engineers worked hard on the optical design of the telescope (and even when some scientists claimed that this telescope was unrealizable...), Lennart Lindegren imagined a design with an eccentric Schmidt telescope: colleagues and engineers working on the Hipparcos design at that time are still wondering from where Lennart had the idea of cutting a sliver from the two halves of the complex mirror before bonding. This was an absolutely decisive contribution to the quality of the Hipparcos images and it impressed many experts in the domain. I am pleased to mention Peter Hollier, brilliant optician engineer at Matra: "I was respectful and admirative for the decisive technical note on the "Eccentric Schmidt" by Lennart Lindegren. A great brain!".

Subsequently, from 1990 to 1997, Lennart Lindegren has been, after Erik Høg, the Team Leader of the "Northern Data Analysis Consortium", sharing with Jean Kovalevsky (responsible for the other Consortium: FAST) the heavy responsibility for the analysis of the Hipparcos data. He also contributed greatly to the "Tycho Data Analysis Consortium" led by E. Høg. While leading NDAC, he continued to design and develop methods and algorithms on many key topics: instrument calibration, satellite attitude determination, processing of double and multiple stars, proximity effects in crowded fields, connection of the Hipparcos data to an extragalactic reference system. I could not list all of them here.

By 1993, 4 years before the publication of the Hipparcos Catalogue, Lennart Lindegren was the first, with Michael Perryman, to propose a new mission of global astrometry, exceeding Hipparcos by several orders of magnitude in terms of astrometric precision and sensitivity: GAIA for “Global Astrometric Interferometer for Astrophysics”. This proposal was presented in 1995 by Lennart Lindegren, Michael Perryman and some other colleagues, including Jean Kovalevsky, François Mignard or Erik Høg, to ESA, within the Horizon 2000+ long-term programme. Again, Lennart Lindegren had, and currently has a crucial role in many aspects of the definition and calibration of the instrument and in the analysis of the data and of their expected accuracy: optimization of the basic angle and of the scanning law, calibration of the chromaticity and consequences on the profile of the photometric filters, optimization of the photometric pass-bands, analysis of the expected precision on the astrometric and photometric parameters, analysis of the sources of systematic errors on trigonometric parallaxes and of the importance of regular measurements of the basic angle, modelling and calibration of radiation effects on CCDs, reconstruction of the satellite attitude, to only quote a few.

Finally, as for Hipparcos, Lennart Lindegren is the main architect of a new method of analysis of the huge amount of astrometric data expected from Gaia (one billion observed objects, mostly stars) that is both rigorous and effective, allowing to obtain a maximum precision on the expected results, test all perturbing effects (numerous at the micro-arcsecond level) and save computation time. A rigorous mathematical formulation of this global iterative solution has allowed the development of a highly efficient algorithm for astrometric analysis.

I'll end with some examples of the fascination of Lennart for a deep understanding of physical phenomena and for finding the best way to tackle them:
- Demonstrate the optimum precision attainable with a given instrument, and find the method that will allow to extract a maximum wealth of information from the observational data.
- Starting from Heisenberg equation, and 3 equations later, show the best astrometric accuracy achievable with a given instrument.
- Give a rigorous definition of the radial velocity, distinguishing between geometric velocity and spectroscopic measurement, distinction essential at the level of the $m.s^{-1}$ accuracy

Finally, one anecdote: about 20 years ago, a colleague made a presentation during an international conference about a proposed mission of space astrometry. Among his slides, he showed, extremely briefly, the optical design of the proposed mission, prepared by leading space experts. During the following coffee break, Lennart came to him and quietly said that this design would not work. He explained why and the colleague realized he was absolutely right. In 20 seconds, Lennart spotted the flaw in a device studied by experts for months ...

Lennart, thank you for giving us the benefit of your sharp and rigorous analysis, and of the simplicity of your solutions to the most complex problems. The benefit is for this magnificent European Gaia Project and therefore for our knowledge of the origin and evolution of our Galaxy. Your way of working reflects your simplicity and your attention to others.

Dear Lennart, I am particularly proud and pleased that the Paris Observatory will now have you among its Doctors Honoris Causa.