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Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Introduction -- Theoretical background -- Spectro-Spatial Interferometry Testbeds -- FIInS -- FIInS Data Processing and Verification -- Simulated Observations with FIInS -- Conclusions and Future Work.
Sommario/riassunto	This thesis describes the physics and computational aspects of an end-to-end simulator to predict the performance of a Space-based Far Infrared Interferometer. The present thesis also includes, the science capabilities and instrumental state-of-the art. The latter is the ambitious next step which the Far-Infrared Astrophysical community needs to take to improve in anyway on the results of the most recent and current space telescopes in this wavelength region. This thesis outlines the requirements involved in such a mission and describes the most promising technique to capture most of the astrophysical information by combining spectroscopy to spatial interferometer. The

simulation of such a system is extremely complex requiring multiple Fourier transforms each of which is subject to instrument non-idealities and appropriate optimization techniques. As a conclusion, the thesis provides an example of the basic performance achievable with such an instrument when targeting a young star formation region.