

1. Record Nr.	UNINA9910777017203321
Autore	Pasini Antonello
Titolo	From observations to simulations [[electronic resource]] : a conceptual introduction to weather and climate modelling // Antonello Pasini
Pubbl/distr/stampa	Hackensack, New Jersey, : ill., 2005
ISBN	1-281-91964-0 9786611919641 981-277-469-6
Descrizione fisica	1 online resource (231 p.)
Disciplina	551.5
Soggetti	Meteorology Climatology
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Preface -- 1. Introduction -- 2. Meteorological and climatic observations. 2.1. The "state" of the weather. 2.2. A definition of climate. 2.3. An overview of meteorological and climatic observations. 2.4. Conventional observations. 2.5. Satellite observations. 2.6. Meteorological or climatic observations? 2.7. Proxy data. 2.8. Is there any evidence that the climate is changing? -- 3. Naive meteorology, coincidences and correlations. 3.1. Approaching an analysis of the data and of common experience. 3.2. A naive interpretation and its problems. 3.3. Coincidences and correlations in available data. 3.4. Let us take stock of the situation -- 4. The theoretical framework: knowledge of single phenomena and complexity of the earth system. 4.1. How can we read the "Great Book of Nature"? 4.2. The local approach to the study of a system. 4.3. The interaction between radiation and matter and the greenhouse effect. 4.4. Greenhouse gases, clouds and aerosols. 4.5. Approaching a complete scheme of warming from the bottom. 4.6. Nature of the ground and air warming. 4.7. An outline of oceanic and atmospheric dynamics. 4.8. Feedbacks and complexity of system -- 5. The Galilean experimental method: a digression? 5.1. Aristotelian physics of local motions and the advent of Galileo Galilei. 5.2. The Galilean "style". 5.3. A Galilean method for studying the weather and the climate? -- 6. Simulation models. 6.1.

How many meanings does the word "model" have? 6.2. The simulation approach. 6.3. Conceptual novelties in the simulation method and its use -- 7. Meteorological models. 7.1. The "perception" of the weather forecasting activity. 7.2. The heart of a meteorological model: primitive equations and their numerical solutions. 7.3. Physical parameterisations. 7.4. Determination of initial state and analysis procedure. 7.5. The products of a meteorological model 7.6. The emergence of deterministic chaos and ensemble integrations. 7.7. A few conceptual remarks -- 8. Climatic models. 8.1. From weather forecasting to climate forecasting: what changes? 8.2. The concept of "attractor" and climatic simulations. 8.3. Approaching the description of a coupled and highly interacting climate system. 8.4. Experiments for validation and sensitivity testing of a climatic model. 8.5. Evolutionary validation and climatic forecasts. 8.6. Simplified models and regional-scale models. 8.7. Simulation results. 8.8. Further remarks about climate change and its study -- 9. Conclusions and prospects. 9.1. The results of climatic models and "what should we do?" 9.2. The future of models for studying the weather and climate.
