

Philosophy Of Science An Overview For Educators

Philosophy of Chemistry investigates the foundational concepts and methods of chemistry, the science of the nature of substances and their transformations. This groundbreaking collection, the most thorough treatment of the philosophy of chemistry ever published, brings together philosophers, scientists and historians to map out the central topics in the field. The 33 articles address the history of the philosophy of chemistry and the philosophical importance of some central figures in the history of chemistry; the nature of chemical substances; central chemical concepts and methods, including the chemical bond, the periodic table and reaction mechanisms; and chemistry's relationship to other disciplines such as physics, molecular biology, pharmacy and chemical engineering. This volume serves as a detailed introduction for those new to the field as well as a rich source of new insights and potential research agendas for those already engaged with the philosophy of chemistry. Provides a bridge between philosophy and current scientific findings Encourages multi-disciplinary dialogue Covers theory and applications The traditional topics of the "philosophy of nature" — space, time, causality, the structure of the universe — are overwhelmingly present in our modern scientific theories. This book traces the complex paths that discussion of these topics has followed, from Plato and Aristotle, through Descartes, Leibniz, Kant and other great thinkers, right up to the relativistic cosmologies and the grand unified theories of contemporary science. In the light of this historical

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development, it becomes clear that modern science gives us not only a technological power over the world, but also a deeper understanding of physical reality. In this sense, science could be regarded as an heir to the traditional "philosophy of nature". Moreover, the reader will learn why science itself deserves to be the subject of philosophical reflection.

Stimulating, thought-provoking text by one of the 20th century's most creative philosophers makes accessible such topics as probability, measurement and quantitative language, causality and determinism, theoretical laws and concepts, more.

Originally published: Englewood Cliffs, N.J.: Prentice Hall, c1992.

Understanding Philosophy of Science

Philosophy of Social Science

An Introduction to the Central Issues

Worldviews

An Introduction to the Philosophy of Science

Scientists use concepts and principles that are partly specific to their subject matter, but they also share part of them with colleagues working in different fields. Compare the biological notion of a 'natural kind' with the general notion of 'confirmation of a hypothesis by certain evidence'. Or compare the physical principle of the 'conservation of energy' and the general principle of 'the unity of science'. Scientists agree that all such notions and principles aren't as crystal clear as one might wish. An important task of the philosophy of the special sciences, such as philosophy of physics, of biology and of economics, to mention only a few of many flourishing examples, is the clarification of such subject specific concepts and principles. Similarly, an important task of 'general' philosophy of science is the clarification of concepts like 'confirmation' and principles like 'the unity of science'. It is evident

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that clarification of concepts and principles only makes sense if it tries to do justice, as much as possible, to the actual use of the notions by scientists, without however following this use slavishly. That is, occasionally a philosopher may have good reasons for suggesting to scientists that they should deviate from a standard use. Frequently, this amounts to a plea for differentiation in order to stop debates at cross-purposes due to the conflation of different meanings. While the special volumes of the series of Handbooks of the Philosophy of Science address topics relative to a specific discipline, this general volume deals with focal issues of a general nature. After an editorial introduction about the dominant method of clarifying concepts and principles in philosophy of science, called explication, the first five chapters deal with the following subjects. Laws, theories, and research programs as units of empirical knowledge (Theo Kuipers), various past and contemporary perspectives on explanation (Stathis Psillos), the evaluation of theories in terms of their virtues (Ilkka Niiniluoto), and the role of experiments in the natural sciences, notably physics and biology (Allan Franklin), and their role in the social sciences, notably economics (Wenceslao Gonzalez). In the subsequent three chapters there is even more attention to various positions and methods that philosophers of science and scientists may favor: ontological, epistemological, and methodological positions (James Ladyman), reduction, integration, and the unity of science as air in the sciences and the humanities (William Bechtel and Andrew Hamilton), and logical, historical and computational approaches to the philosophy of science (Atocha Aliseda and Donald Gillies). The volume concludes with the much debated question of demarcating science from nonscience (Martin Mahner) and the rich European and American history of the philosophy of science in the 20th century (Friedrich Stadler). Comprehensive coverage of the philosophy of science written by leading philosophers in this field Clear style of writing for an interdisciplinary audience No specific pre-knowledge required

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What is the origin of our universe? What are dark matter and dark energy? What is our role in the universe as human beings capable of knowledge? What makes us intelligent cognitive agents seem endowed with consciousness? Scientific research across both the physical and cognitive sciences raises fascinating philosophical questions. *Philosophy and the Sciences For Everyone* introduces these questions and more. It begins by asking what good is philosophy for the sciences before examining the following questions: The origin of our universe Dark matter and dark energy Anthropic reasoning in philosophy and cosmology Evolutionary theory and the human mind What is consciousness? Intelligent machines and the human brain Embodied Cognition. Each chapter includes an introduction, summary and study questions and there is a glossary of technical terms. Designed to be used on the corresponding *Philosophy and the Sciences* online course offered by the University of Edinburgh this book is also a superb introduction to central topics in philosophy of science and popular science.

How does science work? Does it tell us what the world is "really like? What makes it different from other ways of understanding the universe? In *Theory and Reality*, Peter Godfrey-Smith addresses these questions by taking the reader on a grand tour of more than a hundred years of debate about science. The result is a completely accessible introduction to the main themes of the philosophy of science. Examples and asides engage the beginning student, a glossary of terms explains key concepts, and suggestions for further reading are included at the end of each chapter. Like no other text in this field, *Theory and Reality* combines a survey of recent history of the philosophy of science with current key debates that any beginning scholar or critical reader can follow. The second edition is thoroughly updated and expanded by the author with a new chapter on truth, simplicity, and models in science.

This book is the first academic work on the philosophy of engineering in China that reflects two decades of research. It p

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forward a new thesis, namely that the core maxim in the philosophy of engineering is "I create, therefore I am," which is radically different from the Cartesian maxim: "I think, therefore I am." In addition, the book offers the first detailed portrait of the roots and evolution of the philosophy of engineering in China. The book begins by discussing the triptych thesis of science, technology and engineering, which argues that there are a number of important distinctions between the three, e.g. scientific activities are chiefly based on discovery, while technological activities center on invention, and engineering activities focus on creation. Considering the latest developments in the philosophy of engineering, the author also analyzes engineering communities, engineering practice and a micro-meso-macro framework. In subsequent chapters, the author separately analyzes the three stages of engineering activities: planning, operating and using artifacts. In the closing chapter, the author's views on the philosophy of engineering (as a new subdiscipline of philosophy and as a philosophy in its own right) are briefly explained.

A Companion

A Very Short Introduction

Complexity

The Historical Background

An Introduction to the Philosophy of Engineering

This thorough, yet accessible text makes immunology the central illustrative domain of scientific inquiry, rather than physics. Every major issue central to contemporary philosophy of science, from reduction to incommensurability, has a clear illustrative case within immunology. Covers both the positivist model of science and the currently popular alternatives to the positivist model

that flow from Thomas Kuhn's watershed work. Includes a glossary. Annotation copyright by Book News, Inc., Portland, OR
Statisticians and philosophers of science have many common interests but restricted communication with each other. This volume aims to remedy these shortcomings. It provides state-of-the-art research in the area of philosophy of statistics by encouraging numerous experts to communicate with one another without feeling "restricted by their disciplines or thinking "piecemeal in their treatment of issues. A second goal of this book is to present work in the field without bias toward any particular statistical paradigm. Broadly speaking, the essays in this Handbook are concerned with problems of induction, statistics and probability. For centuries, foundational problems like induction have been among philosophers' favorite topics; recently, however, non-philosophers have increasingly taken a keen interest in these issues. This volume accordingly contains papers by both philosophers and non-philosophers, including scholars from nine academic disciplines. Provides a bridge between philosophy and current scientific findings Covers theory and applications Encourages multi-disciplinary

dialogue

Science Teaching argues that science teaching and science teacher education can be improved if teachers know something of the history and philosophy of science and if these topics are included in the science curriculum. The history and philosophy of science have important roles in many of the theoretical issues that science educators need to address: what constitutes an appropriate science curriculum for all students; how science should be taught in traditional cultures; how scientific literacy can be promoted; and the conflict which can occur between science curriculum and deep-seated religious or cultural values and knowledge. Outlining the history of liberal approaches to the teaching of science, Michael Matthews elaborates contemporary curriculum developments that explicitly address questions about the nature and the history of science. He provides examples of classroom teaching and develops useful arguments on constructivism, multicultural science education and teacher education. This book explores central philosophical concepts, issues, and debates in the philosophy of science, both historical and contemporary.

***I Create, Therefore I Am
Philosophical Foundations of Physics
Cutting Nature at Its Seams
An Overview for Cognitive Science
A Contemporary Introduction***

Information is a recognized fundamental notion across the sciences and humanities, which is crucial to understanding physical computation, communication, and human cognition. The Philosophy of Information brings together the most important perspectives on information. It includes major technical approaches, while also setting out the historical backgrounds of information as well as its contemporary role in many academic fields. Also, special unifying topics are high-lighted that play across many fields, while we also aim at identifying relevant themes for philosophical reflection. There is no established area yet of Philosophy of Information, and this Handbook can help shape one, making sure it is well grounded in scientific expertise. As a side benefit, a book like this can facilitate contacts and collaboration among diverse academic milieus sharing

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a common interest in information. • First overview of the formal and technical issues involved in the philosophy of information • Integrated presentation of major mathematical approaches to information, from computer science, information theory, and logic • Interdisciplinary themes across the traditional boundaries of natural sciences, social sciences, and humanities.

This book is an excellent introduction to philosophy for students and provides researchers of scientific disciplines with an opportunity to reflect upon the value and impact of their work. It is also a stimulating read for anybody who is interested in the philosophical issues raised by the status of scientific knowledge in contemporary society.

As the field of Science and Technology Studies (STS) has become more established, it has increasingly hidden its philosophical roots. While the trend is typical of disciplines striving for maturity, Steve Fuller, a leading figure in the field, argues that STS has much to lose if it

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abandons philosophy. In his characteristically provocative style, he offers the first sustained treatment of the philosophical foundations of STS and suggests fruitful avenues for further research. With stimulating discussions of the Science Wars, the Intelligent Design Theory controversy, and theorists such as Donna Haraway and Bruno Latour, *Philosophy of Science and Technology Studies* is required reading for students and scholars in STS and the philosophy of science.

Specifically designed to make the philosophy of mind intelligible to those not trained in philosophy, this book provides a concise overview for students and researchers in the cognitive sciences. Emphasizing the relevance of philosophical work to investigations in other cognitive sciences, this unique text examines such issues as the meaning of language, the mind-body problem, the functionalist theories of cognition, and intentionality. As he explores the philosophical issues, Bechtel draws connections between philosophical views and theoretical and experimental work

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in such disciplines as cognitive psychology, artificial intelligence, linguistics, neuroscience, and anthropology.

A Historical Introduction to the Philosophy of Science

An Historical Introduction

An Introduction to the Philosophy of Science, Second Edition

Problems and Prospects

The Philosophy of Science

A philosopher of science examines the biggest ethical and moral issues in science today, and explains why they matter for all of us -- scientist and layman alike. Science has produced explanations for everything from the mechanisms of insect navigation to the formation of black holes and the workings of black markets. But how much can we trust science, and can we actually know the world through it? How does science work and how does it fail? And how can the work of scientists help -- or hurt -- everyday people? These are not questions that science can answer on its own. This is where philosophy of science comes in. Studying science without philosophy is, to quote Einstein, to be "like somebody who has seen thousands of trees but has never seen a forest." Cambridge philosopher Tim Lewens shows us the forest. He walks us through the theories of seminal philosophers of science Karl Popper and Thomas Kuhn and considers what science is, how far it can and should reach, and how we can determine the nature of its truths and myths. These philosophical issues have consequences that stretch far beyond the laboratory. For instance: What role should scientists have in policy discussions on environmental issues

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such as fracking? What are the biases at play in the search for a biological function of the female orgasm? If brain scans can be used to demonstrate that a decision was made several seconds before a person actually makes a conscious choice, what does that tell us about the possibility of free will? By examining science through this philosophical lens, Lewens reveals what physics can teach us about reality, what biology teaches us about human nature, and what cognitive science teaches us about human freedom. A masterful analysis of the biggest scientific and ethical issues of our age, *The Meaning of Science* forces us to confront the practical, personal, and political purposes of science -- and why it matters to all of us. Few can imagine a world without telephones or televisions; many depend on computers and the Internet as part of daily life. Without scientific theory, these developments would not have been possible. In this exceptionally clear and engaging introduction to philosophy of science, James Ladyman explores the philosophical questions that arise when we reflect on the nature of the scientific method and the knowledge it produces. He discusses whether fundamental philosophical questions about knowledge and reality might be answered by science, and considers in detail the debate between realists and antirealists about the extent of scientific knowledge. Along the way, central topics in philosophy of science, such as the demarcation of science from non-science, induction, confirmation and falsification, the relationship between theory and observation and relativism are all addressed. Important and complex current debates over underdetermination, inference to the best explanation and the implications of radical theory change are clarified and clearly explained for those new to the subject. How much faith should we place in what scientists tell us? Is it possible for scientific knowledge to be fully "objective?" What, really, can be defined as science? In the second

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edition of this Very Short Introduction, Samir Okasha explores the main themes and theories of contemporary philosophy of science, and investigates fascinating, challenging questions such as these. Starting at the very beginning, with a concise overview of the history of science, Okasha examines the nature of fundamental practices such as reasoning, causation, and explanation. Looking at scientific revolutions and the issue of scientific change, he asks whether there is a discernible pattern to the way scientific ideas change over time, and discusses realist versus anti-realist attitudes towards science. He finishes by considering science today, and the social and ethical philosophical questions surrounding modern science. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

Philosophy of Science
A Very Short Introduction
Oxford University Press

Computational Philosophy of Science

An Introduction for Future Knowledge Workers

An Introduction to the History, Logic, and Philosophy of Science

A Unified Approach

Philosophy in Science

A student's future as a knowledge worker (one who "thinks for a living" with the task of problem solving) is the starting point of this book. With this in mind, the book combines a review of philosophical positions and

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problems with practical examples and perspectives gained from everyday challenges faced by knowledge workers in their businesses and organizations. Through the use of summative chapters, highlighted key concepts, questions for reflection, and illustrative examples on how to work with the theories presented, the book provides a clear and accessible introduction to this challenging subject. Philosophy of Science primarily addresses students studying language, communication, marketing, economics, and management. However, the survey of the theoretical schools of thought - as well as the discussions on research ethics and the role of research in society - will be equally relevant for other students in the humanities and the natural and social sciences. This text focuses on two major issues: the nature of scientific inquiry and the relations between scientific disciplines. Designed to introduce the basic issues and concepts in the philosophy of science, Bechtel writes for an audience with little or no philosophical background. The first

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part of the book explores the legacy of Logical Positivism and the subsequent post-Positivist developments in the philosophy of science. The second section examines arguments for and against using a model of theory reduction to integrate scientific disciplines. The book concludes with a chapter describing non-reductionist approaches for relating scientific disciplines using psycholinguistic and cognitive neuroscience models.

This textbook offers an introduction to the philosophy of science. It helps undergraduate students from the natural, the human and social sciences to gain an understanding of what science is, how it has developed, what its core traits are, how to distinguish between science and pseudo-science and to discover what a scientific attitude is. It argues against the common assumption that there is fundamental difference between natural and human science, with natural science being concerned with testing hypotheses and discovering natural laws, and the aim of human and some social sciences being to understand the meanings of

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individual and social group actions. Instead examines the similarities between the sciences and shows how the testing of hypotheses and doing interpretation/hermeneutics are similar activities. The book makes clear that lessons from natural scientists are relevant to students and scholars within the social and human sciences, and vice versa. It teaches its readers how to effectively demarcate between science and pseudo-science and sets criteria for true scientific thinking. Divided into three parts, the book first examines the question What is Science? It describes the evolution of science, defines knowledge, and explains the use of and need for hypotheses and hypothesis testing. The second half of part I deals with scientific data and observation, qualitative data and methods, and ends with a discussion of theories on the development of science. Part II offers philosophical reflections on four of the most important concepts in science: causes, explanations, laws and models. Part III presents discussions on philosophy of mind, the relation

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between mind and body, value-free and value-related science, and reflections on actual trends in science.

Philosophy of Science: A Unified Approach combines a general introduction to philosophy of science with an integrated survey of all its important subfields. As the book's subtitle suggests, this excellent overview is guided methodologically by "a unified approach" to philosophy of science: behind the diversity of scientific fields one can recognize a methodological unity of the sciences. This unity is worked out in this book, revealing all the while important differences between subject areas. Structurally, this comprehensive book offers a two-part approach, which makes it an excellent introduction for students new to the field and a useful resource for more advanced students. Each chapter is divided into two sections. The first section assumes no foreknowledge of the subject introduced, and the second section builds upon the first by bringing into the conversation more advanced, complementary topics. Definitions, key

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propositions, examples and figures overview all of the core material. At the end of every chapter there are selected readings and exercises (with solutions at the end of the book). The book also includes a comprehensive bibliography and an index.

The Philosophy of Science and Technology Studies

Introduction to the Philosophy of Science

Philosophy of Science

Philosophy of Information

"This volume explores the nature of complexity and considers its bearing on our world and how we manage our affairs within it." "Rescher's overall lesson is that the management of our affairs within a socially, technologically, and cognitively complex environment is plagued with vast management problems and risks of mishap. Although Rescher offers a sobering outlook, he also believes that complexity entails mixed blessings: our imperfect knowledge provides a rationale for putting forth our best efforts. This volume will be of interest to those interested in philosophy, the philosophy of science, science policy studies, and future studies." --Book Jacket.

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This anthology of selections from the works of noted philosophers affords the student an immediate contact with the unique historical background of the philosophy of science. The selections, many of which have not been readily accessible, follow the development of the philosophy of science from 1786 to 1927. Each selection is preceded by a brief introduction by the editor designed to familiarize the reader with a particular philosopher and provide insights into his work. Joseph J. Kockelmans divides the selections into several sections. Part 1, from 1786-1850, includes chapters by Immanuel Kant, on the metaphysical foundations of natural science, John Frederick William Herschel, on experience and the analysis of phenomena, William Whewell, on the nature and conditions of inductive science, and John Stuart Mill, on induction and the law of universal causation; part 2, from 1870-1899, includes chapters by Hermann Von Helmholtz, on the origin and significance of geometrical axioms, William Stanley Jevons, on the philosophy of inductive inference, John Bernard Stallo, on the kinetic theory of gasses and the conditions of the validity of scientific hypotheses, Ernst Mach, on the economical nature of physical inquiry, Karl Pearson, on perceptual and conceptual space, Emile Boutroux, on mechanical laws, Heinrich

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Hertz, on the appropriateness, correctness, and permissibility of scientific theories, and Ludwig Boltzmann, on the fundamental principles and basic equations of mechanics. The third part, covering the first decade of the twentieth century, includes chapters by Henri Jules Poincare, on science and reality, Charles Peirce, on Induction, Pierre Marie Duhem, on the laws of physics, William Ostwald, on energetism and mechanics, Emile Meyerson, on identity of thought and nature as the final goal of science, Ernst Cassirer, on functional concepts of natural science; part 4, from 1910-1927, includes chapters by Charles Dunbar Broad, on phenomenalism, Alfred North Whitehead, on time, space, and material, Bertrand Russell, on the world of physics and the world of sense, Norman Robert Cambbell, on the meaning of science, Moritz Schlick, on basic issues of the philosophy of natural science, and Percy Williams Bridgman, on the concepts of space, time, and causality. Philosophy of Science provides a concise single volume text to the discipline and enables students to understand and evaluate the various trends in our contemporary philosophy of science. Joseph J. Kockelmans is professor emeritus of philosophy at the Pennsylvania State University. Study Questions; Suggested Readings; 5

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Causation, Inexact Laws and Statistical Probabilities; Overview; Causes as Explainers; Ceteris Paribus Laws; Statistical Laws and Probabilistic Causes; Explanation as Unification; Summary; Study Questions; Suggested Readings; 6 Laws and Explanations in Biology and the "Special Sciences"; Overview; Dissatisfaction with Causal Explanations; Proprietary Laws in the "Special Sciences"; Functional Laws and Biological Explanations; Explaining Purposes or Explaining Them Away?; From Intelligibility to Necessity; Summary; Study Questions

PRAISE FOR PREVIOUS EDITIONS "This is a brilliantly clear introduction (and indeed reframing) of the history and philosophy of science in terms of worldviews and their elements.... In addition, the book is incredibly well-informed from both a scientific and philosophical angle. Highly recommended." Scientific and Medical Network "Unlike many other introductions to philosophy of science, DeWitt's book is at once historically informative and philosophically thorough and rigorous. Chapter notes, suggested readings, and references enhance its value." Choice "Written in clear and comprehensible prose and supplemented by effective diagrams and examples, Worldviews is an ideal text for anyone new to the history and

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philosophy of science. As the reader will come to find out, DeWitt is a gifted writer with the unique ability to break down complex and technical concepts into digestible parts, making *Worldviews* a welcoming and not overwhelming book for the introductory reader." *History and Philosophy of the Life Sciences*, vol. 28(2) Now in its third edition, *Worldviews: An Introduction to the History and Philosophy of Science* strengthens its reputation as the most accessible and teachable introduction to the history and philosophy of science on the market. Geared toward engaging undergraduates and those approaching the history and philosophy of science for the first time, this intellectually-provocative volume takes advantage of its author's extensive teaching experience, parsing complex ideas using straightforward and sensible examples drawn from the physical sciences. Building on the foundations which earned the book its critical acclaim, author Richard DeWitt considers fundamental issues in the philosophy of science through the historical worldviews that influenced them, charting the evolution of Western science through the rise and fall of dominant systems of thought. Chapters have been updated to include discussion of recent findings in quantum theory, general relativity, and evolutionary theory, and

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two new chapters exclusive to the third edition enrich its engagement with radical developments in contemporary science. At a time in modern history when the nature of truth, fact, and reality seem increasingly controversial, the third edition of *Worldviews* presents complex concepts with clarity and verve, and prepares inquisitive minds to engage critically with some of the most exciting questions in the philosophy of science.

Science and Objectivity

Reading the Book of Nature

Integrating History and Philosophy of Science

Philosophy of Chemistry

Philosophy of Statistics

This book is a balanced and up-to-date introduction to the philosophy of science. It covers all the main topics in the area, as well as introducing the student to the moral and social reality of science. The author's style is free from jargon, and although he makes use of scientific examples, these should be intelligible to those without much scientific background. At the same time the questions he raises are not merely abstract, so the book will be of interest and concern to scientists as well as philosophers. The author discusses the growth of knowledge of science, the status of scientific theories and their relationship to observational data, the extent to which scientific theories rest on unprovable paradigms, and the nature of scientific explanations. In later chapters he considers probability, scientific reductionism, the relationship between science and technology, and the relationship between scientific and other values.

Though the publication of Kuhn's *Structure of Scientific*

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Revolutions seemed to herald the advent of a unified study of the history and philosophy of science, it is a hard fact that history of science and philosophy of science have increasingly grown apart. Recently, however, there has been a series of workshops on both sides of the Atlantic (called '&HPS') intended to bring historians and philosophers of science together to discuss new integrative approaches. This is therefore an especially appropriate time to explore the problems with and prospects for integrating history and philosophy of science. The original essays in this volume, all from specialists in the history of science or philosophy of science, offer such an exploration from a wide variety of perspectives. The volume combines general reflections on the current state of history and philosophy of science with studies of the relation between the two disciplines in specific historical and scientific cases.

This comprehensive textbook provides a clear nontechnical introduction to the philosophy of science. Through asking whether science can provide us with objective knowledge of the world, the book provides a thorough and accessible guide to the key thinkers and debates that define the field. George Couvalis surveys traditional themes around theory and observation, induction, probability, falsification and rationality as well as more recent challenges to objectivity including relativistic, feminist and sociological readings. This provides a helpful framework in which to locate the key intellectual contributions to these debates, ranging from those of Mill and Hume, through Popper and Kuhn to Laudan, Bloor and Garfinkel among others.

The Philosophy of Social Science: A Contemporary Introduction examines the perennial questions of philosophy by engaging with the empirical study of society. The book offers a comprehensive overview of debates in the field, with special attention to questions arising from new research

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programs in the social sciences. The text uses detailed examples of social scientific research to motivate and illustrate the philosophical discussion. Topics include the relationship of social policy to social science, interpretive research, action explanation, game theory, social scientific accounts of norms, joint intentionality, reductionism, causal modeling, case study research, and experimentation.

Philosophy of Mind

An Introduction to the History and Philosophy of Science

General Philosophy of Science: Focal Issues

The Meaning of Science

Theory of Science

The book is a translation of the second edition of a much-used and research-based Chinese textbook. As a succinct and issue-based introduction to the Western philosophy of science, the book brings eight focal issues in the field to the fore and augments each topic by incorporating Chinese perspectives. Followed by an overview of the historical framework and logical underpinnings of the philosophy of science, the book thoroughly discusses eight issues in the discipline: (1) the criteria of cognitive meaning, (2) induction and confirmation, (3) scientific explanation, (4) theories of scientific growth, (5) the demarcation between science and pseudoscience, (6) scientific realism and empiricism; (7) the philosophy of scientific experimentation, (8) science and value. Not confined to Western mainstream discourse in this field, the book also introduces voices of Chinese philosophers of note and adopts a stance that productively combines logical empiricism and Kuhnianism, both of which tend to be covered in less detail by many English language textbooks. In the final chapter the author offers a prognosis regarding the future of the discipline based on recent trends. This book will be of value to students

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who study philosophy of science and hope to gain a better understanding of science and technology.

By applying research in artificial intelligence to problems in the philosophy of science, Paul Thagard develops an exciting new approach to the study of scientific reasoning. This approach uses computational ideas to shed light on how scientific theories are discovered, evaluated, and used in explanations. Thagard describes a detailed computational model of problem solving and discovery that provides a conceptually rich yet rigorous alternative to accounts of scientific knowledge based on formal logic, and he uses it to illuminate such topics as the nature of concepts, hypothesis formation, analogy, and theory justification.

The first in-depth reference to the field that combines scientific knowledge with philosophical inquiry, this encyclopedia brings together a team of leading scholars to provide nearly 150 entries on the essential concepts in the philosophy of science. The areas covered include biology, chemistry, epistemology and metaphysics, physics, psychology and mind, the social sciences, and key figures in the combined studies of science and philosophy. (Midwest). Designed for first-time readers of the subject, this stimulating introduction offers a historical exposition of differing views on the philosophy of science. With concise profiles presenting the major philosophers whose contributions are discussed in this book, Losee explores the long-argued questions raised by philosophers and scientists about the proper evaluation of science. This new edition incorporates contemporary developments in the discipline, including recent work on theory-appraisal, experimental practice, the debate over scientific realism, and the philosophy of biology. Taking a

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balanced and informative approach, this work is the ideal introductory volume.

A Philosophical Overview

Philosophy and the Sciences for Everyone

Theory and Reality

Science Teaching

Philosophy of Science for Scientists

Philosophy of science studies the methods, theories, and concepts used by scientists. It mainly developed as a field in its own right during the twentieth century and is now a diversified and lively research area. This book surveys the current state of the discipline by focusing on central themes like confirmation of scientific hypotheses, scientific explanation, causality, the relationship between science and metaphysics, scientific change, the relationship between philosophy of science and science studies, the role of theories and models, unity of science. These themes define general philosophy of science. The book also presents sub-disciplines in the philosophy of science dealing with the main sciences: logic, mathematics, physics, biology, medicine, cognitive science, linguistics, social sciences, and economics. While it is common to address the specific philosophical problems raised by physics and biology in such a book, the place assigned to the philosophy of special

sciences is much more unusual. Most authors collaborate on a regular basis in their research or teaching and share a common vision of philosophy of science and its place within philosophy and academia in general. The chapters have been written in close accord with the three editors, thus achieving strong unity of style and tone.

Why should we believe what science tells us about the world? Observation data, confirmation of theories, and the explanation of phenomena are all considered in an introductory survey of the philosophy of science.