TIME and SPACE

KENNETH KAH CHEONG CHAN

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of the publisher.

© November 23 1988 by Kenneth Kah Cheong Chan

ISBN 981-00-1134-2

Contents

I	Introduction	1
II	The Meaning of Time and Space	2
III	The Lorentz Transformation Equations	10
IV	Acceleration and the Effects of Changing Inertial Reference Frames	18
V	The Twin Paradox	25
VI	Conclusion	30
	References	32

I

Introduction

Einstein's theory of relativity has dramatically modified man's view of time and space but understanding is still largely incomplete. The attempt at synthesis of time and space started by Minkowski has not matured fully, but has been left substantially a mathematical concept. The theory of relativity also gave rise to one of the longest standing controversies in physics this century, namely, the problem of the twin paradox. It has yet not been fully resolved.

Perhaps at no other time in the history of physics than the present, has physical and intuitive understanding lagged so far behind mathematical mastery of its complexities. We now possess numerous beautiful mathematical theories which are largely unaccompanied by physical interpretation. It is therefore mainly in the hope of providing new insights into the physical meaning of time and space that this paper is written.