

PROGRESS IN LIQUID CRYSTAL SCIENCE AND TECHNOLOGY

In Honor of
Shunsuke Kobayashi's 80th Birthday

Series on Liquid Crystals

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In Honor of Kobayashi's 80th Birthday
edited by Hoi-Sing Kwok, Shohei Naemura and Hiap Liew Ong

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To
Ying-Hung, Michiyo and I-An Jennifer

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PREFACE

It is no exaggeration to say that information technology has transformed our way of living tremendously, and all for the better. For example, the Internet puts an infinite amount of information at our fingertips. Mobile phones enable us to be in constant contact with business associates, friends and most importantly, our family. Televisions, of course, have made our leisure times more enjoyable. Underlying all these information technology wonders is the prominent presence of liquid crystal displays (LCDs). Without LCDs, the information superhighway would be rather dull. In fact, without the availability of high-resolution displays, a lot of information will become rather meaningless.

Japan has led the world in the development of LCD since the 1970s. Japanese companies were the first to commercialize passive-matrix TN-LCDs and later high-resolution active-matrix LCDs. They have continued to introduce revolutionary and evolutionary improvements to LCD technologies. During all this time, Prof. Shunsuke Kobayashi has made essential contributions to Japan's prominence in LCD development. He is well known not only for his own groundbreaking research, but also for the training of many prominent figures in the display industry, both in Japan and in other countries. He also helped to establish many large government projects and alliances for the development of Japan's LCD industry. It is not an exaggeration to say that Kobayashi sensei was the chief architect of the LCD industry in Japan.

In 2009, the three of us successfully organized a mini-symposium during *Eurodisplay* in Rome to celebrate the 77th birthday of Prof. Kobayashi. It was a joyous occasion, as many friends in the display field gave commemorative talks. We thought it would be appropriate, for his 80th

birthday, to follow it up with a more permanent record of celebration, while simultaneously looking back on the tremendous progress that has been made in the past 20 years in the field of LCD. Thus this book is both a celebration of Prof. Kobayashi's accomplishments and a stock taking of the field of LCD. It is an anthology of review articles on various new developments in LCD technologies written by experts in the field.

Professor Kobayashi's work in LCD spanned more than 40 years. Trained as a solid state physicist, he has made LCD his lifelong career. Remarkably, he is still active in researching and in generating new ideas. When we embarked on this book project, we were sure that many of his friends would want to contribute — and we were correct. There is no lack of high-quality contributions to this book from many prominent researchers in the field of liquid crystal science and technology. Indeed we are very happy to find that many of the chapters submitted are so well written and timely that this anthology is bound to become one of the major reference books on liquid crystal science and technology. We are most grateful to all the contributors for the time and effort spent on the papers highlighting their areas of expertise.

This book starts out with a review of research by Professor Kobayashi himself. The remaining chapters fall into the following five categories: (1) LC materials, (2) Alignment technologies, (3) Wide viewing angle technologies, (4) LC optics, and (5) LC displays and applications. These are all important topics for practical devices. There are contributions on basic physics and chemistry of liquid crystals, as well as detailed descriptions of specific display applications. We sincerely hope you, the reader, will enjoy this book as much as we do, and will agree with us that the contributions are truly of the highest quality. Finally, we thank Prof. Kobayashi for his encouragements and assistance in putting this book together, and we sincerely wish him many happy returns.

Hoi-Sing Kwok
Shohei Naemura
Hiap Liew Ong
July 2012

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