清华大学70和80年代的液晶研究

林磊

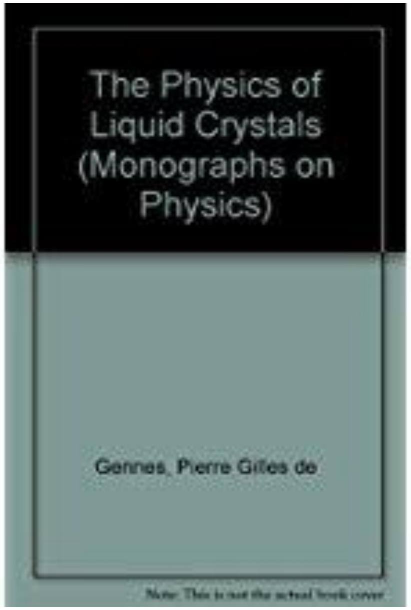
美国加州圣何塞州立大学、中国科学院物理研究所、中国科学技术协会科普研究所

液晶简史

- 1888 （棒型）液晶在欧洲发现

基础研究

- 1960末 - 1980末 法国巴黎南大学 Pierre-Gilles de Gennes、美国哈佛大学 Paul Martin 等理论物理学家介入，液晶研究成为显学


The Physics of Liquid Crystals (Monographs on Physics)

Gennes, Pierre Gilles de

1974 液晶物理第一本书

- 1991 de Gennes 獲诺贝尔物理学奖

De Gennes (1932-2007)

液晶显示

- 1970　(扭曲向列相)液晶显示发明
- 1988　液晶电视面世
- 2017　液晶显示是全球年产千亿美元的重要产业

中国液晶面板产量位居全球第一

~ 1975

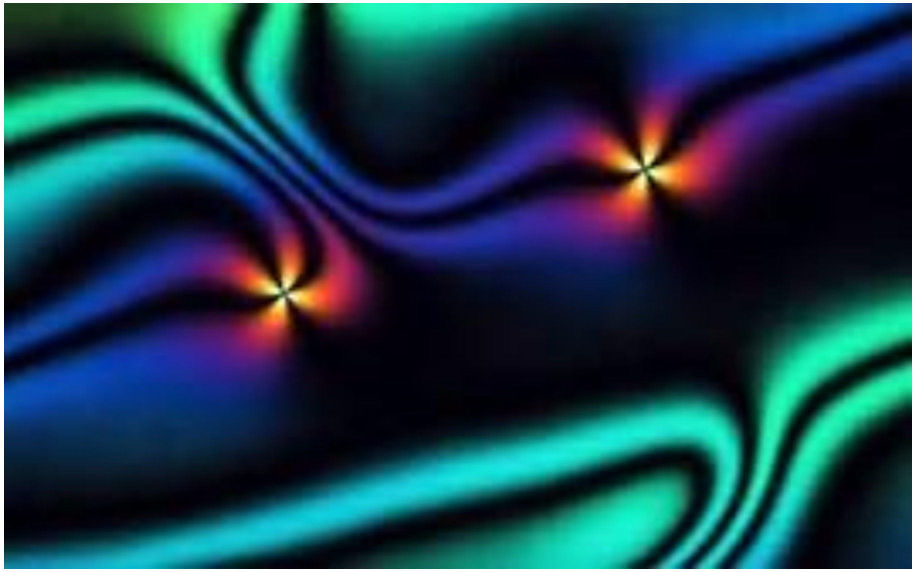
1984

1988

清华液晶大屏幕投影电视

1969-1978

背景



- 1960 末 我国液晶研究开始
- 1967 青蒿素攻关大协作开始（毛主席批准）
- 1969 清华大学组织了一个跨学科、跨单位的液晶电视攻克小组

  (清华基础部领导李卓宝批准)

清华液晶电视领军人物

阮亮

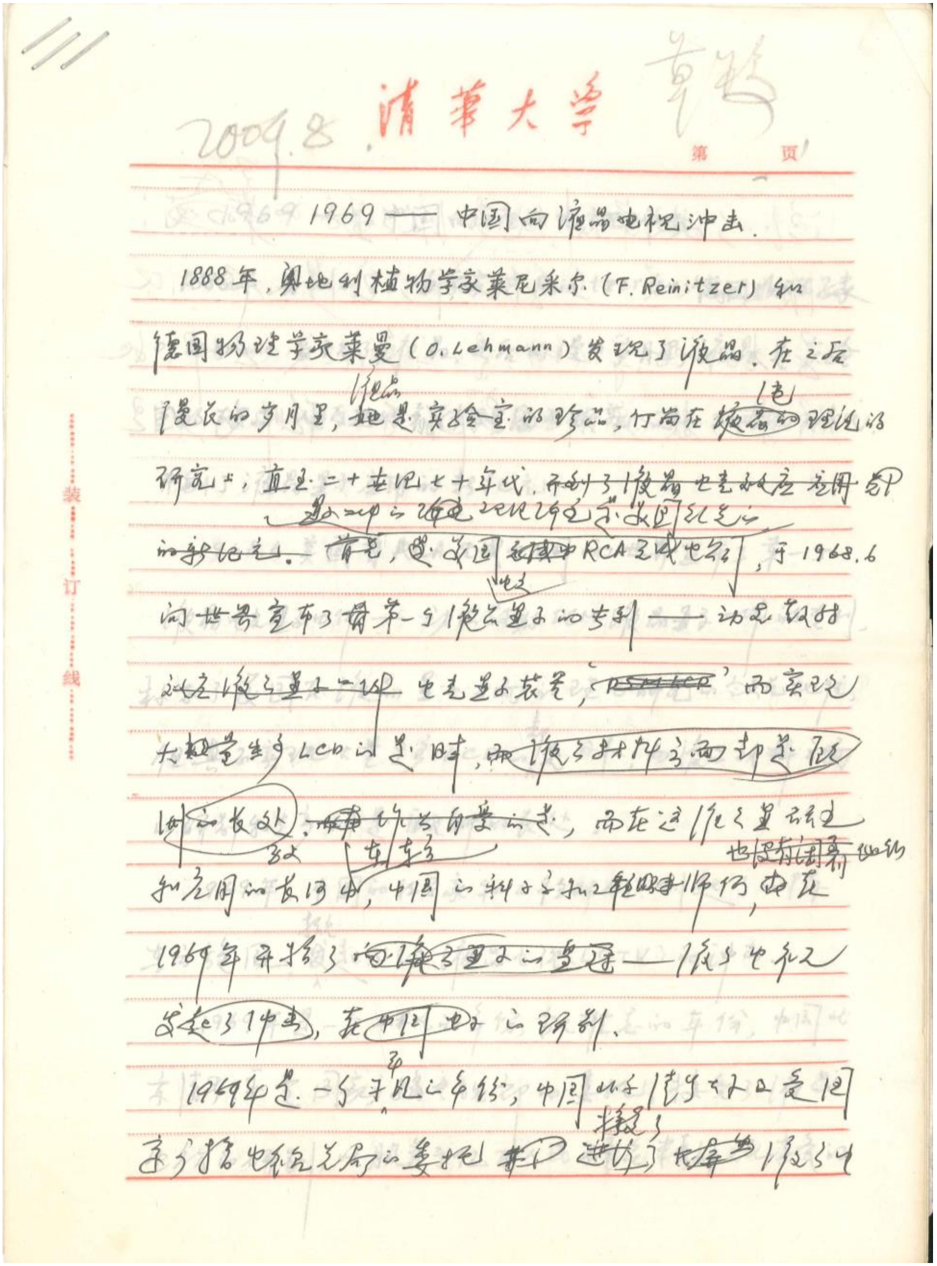
- 1939 生于上海
- 1962 清华物理学士（论文导师：王明贞）

  留校物理系教研工作 （理论/实验）
- 1969 筹建液晶大屏幕投影电視科研组
- 1999 退休

赵静安

- 1929 生
- 辅仁大学物理系华业
- 1952 分配到清华大学

液晶电视项目单位人员



2009.8 清華大學

第 1 页

1969 —— 中国向液晶电视冲击.

1888年，奥地利植物学家莱尼采尔（F. Reinitzer）和德国物理学家莱曼（O. Lehmann）发现了液晶。在之后漫长的岁月里，~~她~~液晶是实验室的珍品，仍尚在[illegible]的理论的研究中；直至二十世纪七十年代，~~开创了液晶电光效应应用的新纪元~~ [illegible] ~~首先~~，美国[illegible]RCA公司[illegible]，于1968.6向世界宣布了第一个液晶显示的专利——动态散射液晶显示[illegible]电光显示装置，~~"DSM LCD"~~ 而实现大规模生产LCD的是日本时，而液晶材料[illegible]的长处，[illegible]，而在这液晶显示技术[illegible]和应用的长河中，中国的科学家和工程师们，由于1969年开始了向液晶显示的进军——液晶电视发起了冲击，在中国也有[illegible]的研制。

1969年是一个平凡的年份，中国[illegible]多个指挥电视[illegible]的[illegible] 进行了~~[illegible]~~ 液晶[illegible]

北京

清华大学

物理系

阮亮

赵静安

童寿生

化学系

王良御

电子系

外語系

。。。

上海

中科院有机所

刘铸晋

洪熙君

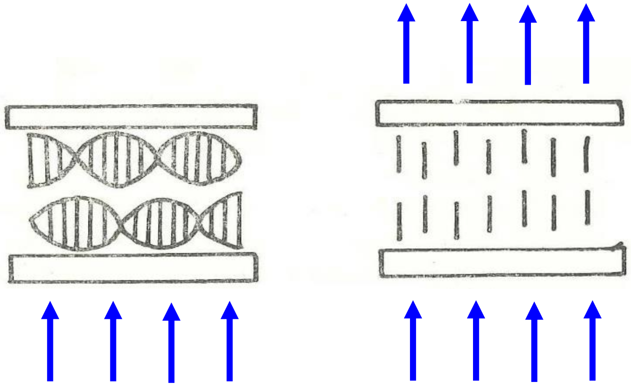
复旦大学

黄嘉华

。。。

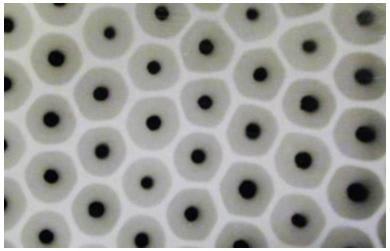
液晶投影电视原理

垂直电场可让棒型分子垂直排列

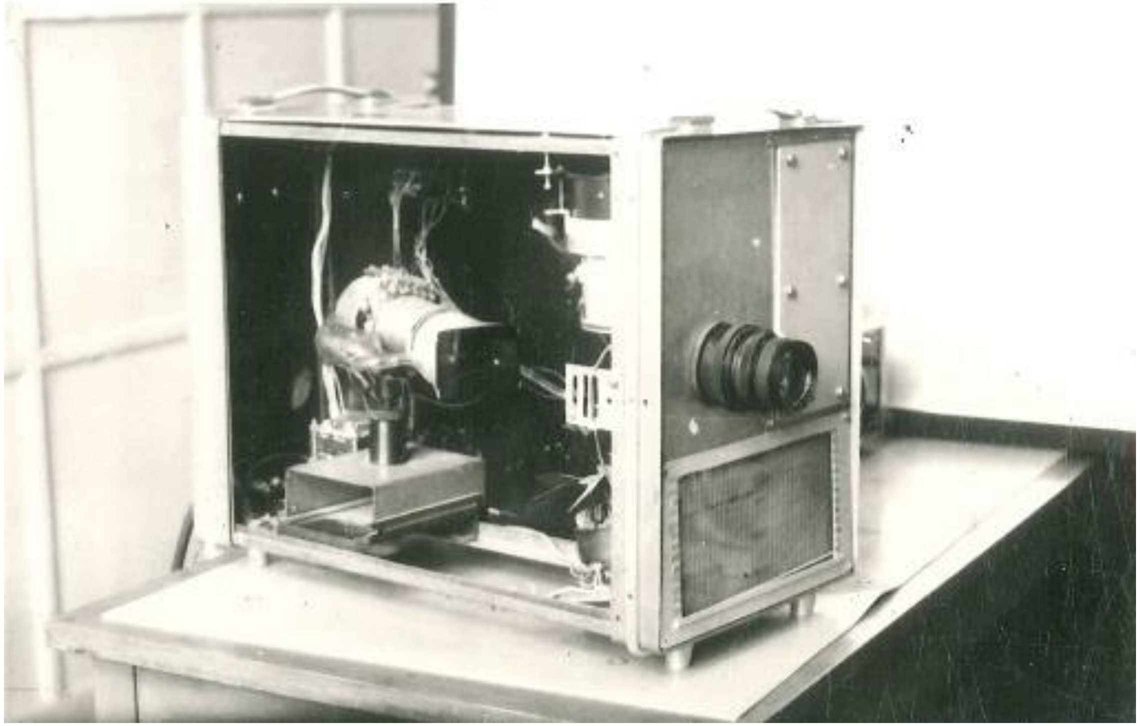


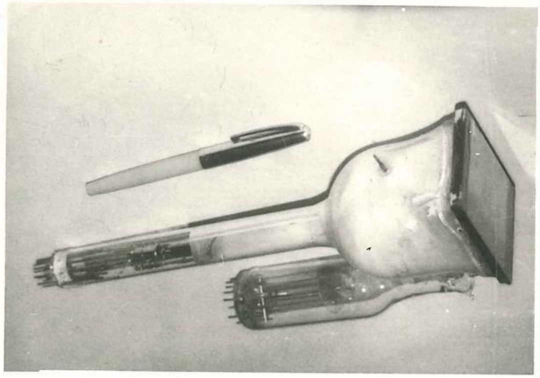
不透光（黑）　　透光（白）

无电场　　有电场



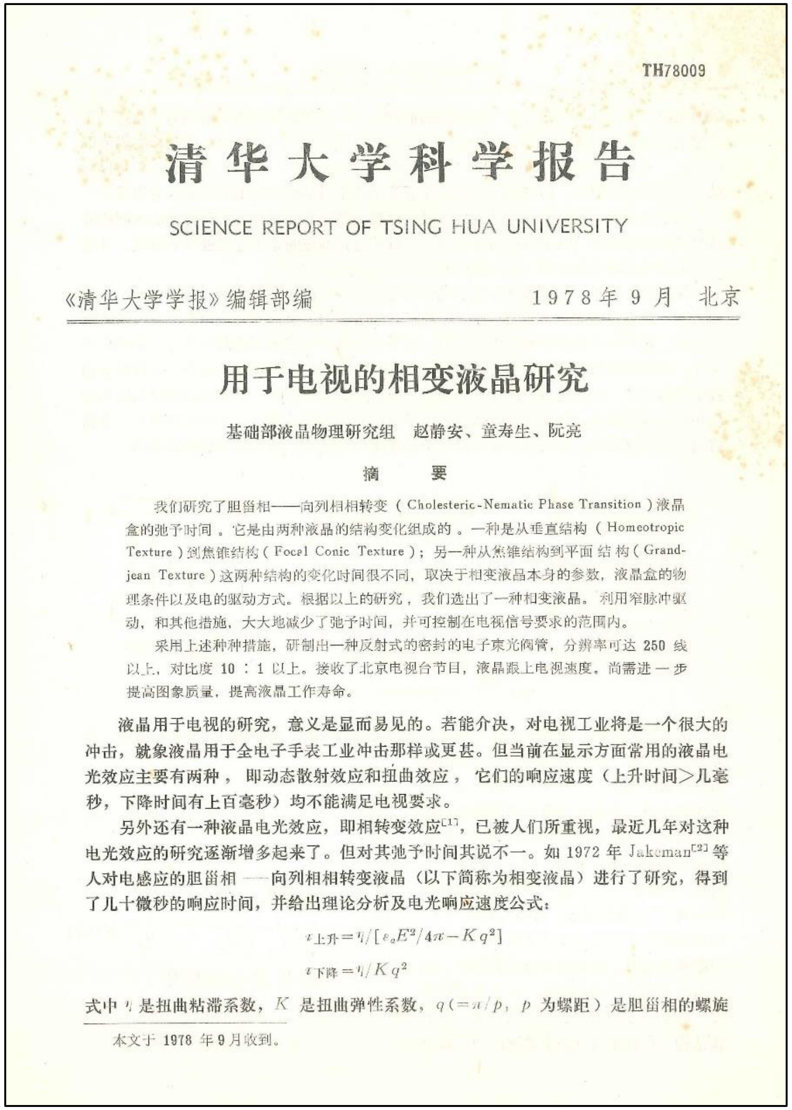
液晶盒矩阵





成功与获奖

液晶大屏幕投影电视



TH78009

清华大学科学报告

SCIENCE REPORT OF TSING HUA UNIVERSITY

《清华大学学报》编辑部编　　1978年9月　北京

用于电视的相变液晶研究

基础部液晶物理研究组　赵静安、童寿生、阮亮

摘　要

我们研究了胆甾相——向列相相转变（Cholesteric-Nematic Phase Transition）液晶盒的弛予时间。它是由两种液晶的结构变化组成的。一种是从垂直结构（Homeotropic Texture）到焦锥结构（Focal Conic Texture）；另一种从焦锥结构到平面结构（Grandjean Texture）这两种结构的变化时间很不同，取决于相变液晶本身的参数，液晶盒的物理条件以及电的驱动方式。根据以上的研究，我们选出了一种相变液晶。利用窄脉冲驱动，和其他措施，大大地减少了弛予时间，并可控制在电视信号要求的范围内。

采用上述种种措施，研制出一种反射式的密封的电子束光阀管，分辨率可达 250 线以上，对比度 10 ∶ 1 以上。接收了北京电视台节目，液晶跟上电视速度。尚需进一步提高图象质量，提高液晶工作寿命。

液晶用于电视的研究，意义是显而易见的。若能介决，对电视工业将是一个很大的冲击，就象液晶用于全电子手表工业冲击那样或更甚。但当前在显示方面常用的液晶电光效应主要有两种，即动态散射效应和扭曲效应，它们的响应速度（上升时间>几毫秒，下降时间有上百毫秒）均不能满足电视要求。

另外还有一种液晶电光效应，即相转变效应[1]，已被人们所重视，最近几年对这种电光效应的研究逐渐增多起来了。但对其弛予时间其说不一。如 1972 年 Jakeman[2] 等人对电感应的胆甾相——向列相相转变液晶（以下简称为相变液晶）进行了研究，得到了几十微秒的响应时间，并给出理论分析及电光响应速度公式：

$$\tau_{\text{上升}} = \eta/[\varepsilon_a E^2/4\pi - K q^2]$$

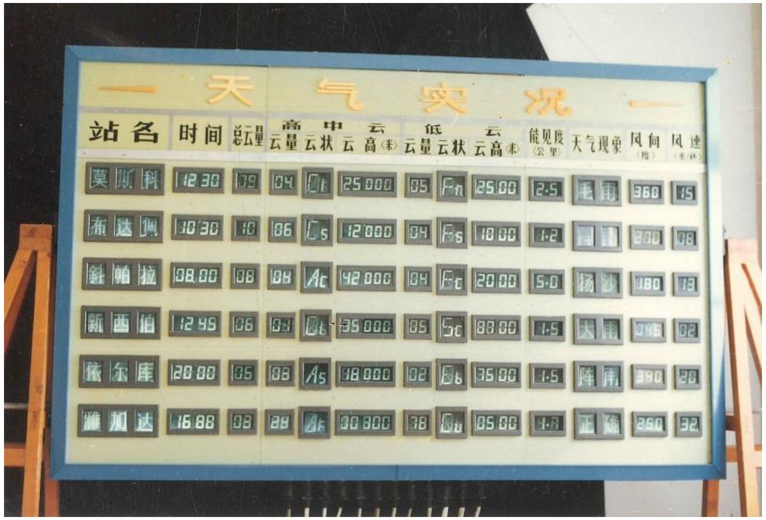
$$\tau_{\text{下降}} = \eta/K q^2$$

式中 η 是扭曲粘滞系数，K 是扭曲弹性系数，$q\,(=\pi/p$，p 为螺距）是胆甾相的螺旋

本文于 1978 年 9 月收到。

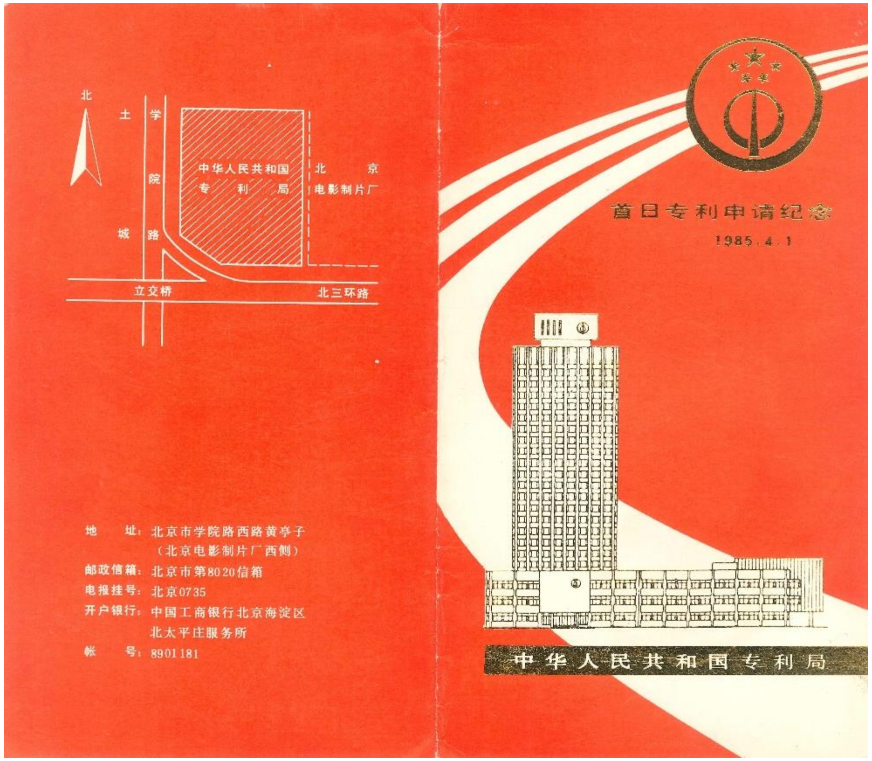
- 1975　突破液晶电视的快速响应关
- 1976　获得 ~ 1 ms 响应时间和 3 x 4 m^2 的液晶大屏幕快速投影电视图象，领先全球
  （收入日本冈野光治液晶书中）
- 1978　中国科学大会奖

自存贮大表格汉字字符显示装置



- 1985 首批国家发明专利
- 1987 电子工业部科技进步成果二等奖

  国家发明三等奨



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（北京电影制片厂西侧）
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电报挂号：北京0735
开户银行：中国工商银行北京海淀区
北太平庄服务所
帐　　号：8901181

首日专利申请纪念
1985.4.1

中华人民共和国专利局

中华人民共和国主席令（第十一号）

《中华人民共和国专利法》已由中华人民共和国第六届全国人民代表大会常务委员会第四次会议于一九八四年三月十二日通过，现予公布。自一九八五年四月一日起施行。

中华人民共和国主席　李先念
一九八四年三月十二日

申请号　85100112

申请人：清华大学

代理人：黄冠颖

发明创造名称：自存储型液晶大表格显示方法

清华液晶基础研究

1978-1988

清华液晶物理教研组

- 1977　高考恢复
- 1978　改革开放。清华基础部(后称物理系)成立液晶物理教研组 (国内首个液晶学科实体)

  招进首批液晶研究生 (4个硕士生：欧阳钟灿、王新久、阮丽真、XX)


物理教研组一九八〇届研究生毕业合影 1981.1.16.

1949前8代留学生

1. 第1代 (1872-1875): The Qing Dynasty government sent out 120 children, aged 12-15, to the USA to study (including 容闳 (1828-1912)).
2. 第2代 (1877): Nearly 100 navy students sent to Europe in early years of Qing Dynasty's Emperor Kuang-Xu.
3. 第3代 : Students going to Japan in the early 20th century (including 周恩来).
4. 第4代 : Students going to the USA under the auspices of the Boxer Indemnity.
5. 第5代 : Students going to France to study and work (including 严济慈、周恩来、邓小平).
6. 第6代 : Students going to USSR during the 1920s.
7. 第7代 (1927-1937): Students going abroad (including 任之恭、 吴大猷、 施汝为、吴健雄、錢三强).
8. 第8代 (1938-1948): Students going to Europe and USA (including 彭桓武、黄昆; China's first two Nobelists, 杨振宁、李政道； 王浩、李蔭远、谢毓章).

1949后3代留学生

9. 第9代(1949-now): A large number of students from Taiwan and Hong Kong, and a few from Macau, went to USA and Europe (including the four Nobelists: 丁肇中、李远哲、崔崎、高崐； 林磊).

10. 第10代(1950s): Students going to USSR sent by the Chinese government (including 管惟炎、蒲富恪、郝柏林、于渌).

11. 第11代(1978-now): Students from mainland China, going to USA, Europe, etc., sent officially or going privately (including 施一公、饶毅).

中国一共有11代留学生

1949后3代海归

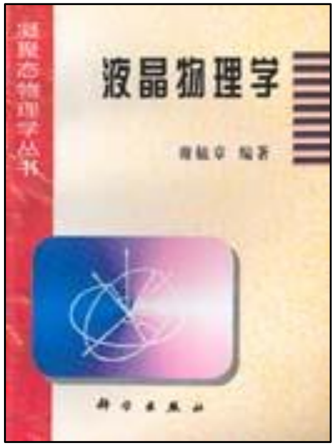
1. 第1代 (1950s): Those coming back mainly from USA and Europe, soon after People’s Republic of China was established (including 錢学森、李蔭远、谢毓章).

2. 第2代 (mostly 1975-1985): Nearly 100 students of the 9th generation returned to China, mostly after the Cultural Revolution (including 林磊) .

3. 第3代 (after 1980): These are the 11th generation students returning when the reform-and-opening up process in China is picking up speed (including 施一公、饶毅、杨振宁).

谢毓章

1915-2011



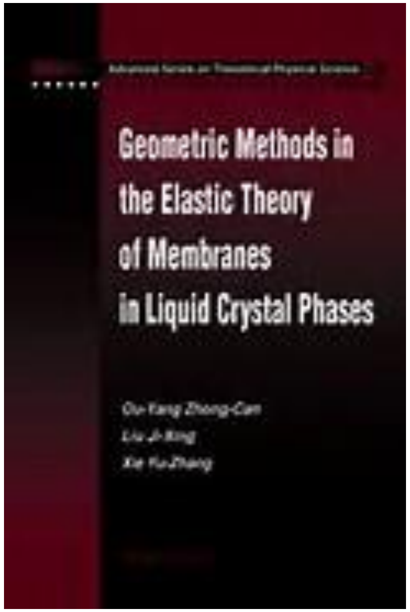
1988

- 1915　生于江苏省苏州市
- 1936　清华理学学士
- 1942　清华大学理学硕士学位。任西南联大电讯专修科教员
- 1945～1948 中央大学物理系副教授兼校长室秘书
- 1948～1950 美国范德比尔特（Vanderbilt）大学，获哲学博士
- 1955～1957 美国威奇塔（Wichita)大学物理系副教授
- 1957　回国
- 1957～1968，1975～1986 清华大学基础课委员会物理教研组、现代应用物理系教授
- 1980～1986 中国物理学会液晶分科学会第一届理事长
- 1986　自清华退休
- 2011　北京去世

第8代留学生，第1代海归，文革中被关进监狱4年（1968-1972）

欧阳钟灿

- 1946　生于福建泉州
- 1968　清华自动控制系毕业
- 1978　重入清华（导师：谢毓章、徐亦庄）
- 1984　清华(光学专业)理学博士
- 1986　西德洪堡奖学金到柏林自由大学
- 1997　中国科学院院士
- 1998-2007 中科院理论物理研究所所长



Geometric Methods in the Elastic Theory of Membranes in Liquid Crystal Phases

Ou-Yang Zhong-Can
Liu Ji-Xing
Xie Yu-Zhang

1999

博士学位论文答辩会
论文题目：丝状液晶中的挠电效应理论
培养单位：物理系
研究生：欧阳钟灿
指导教师：徐亦庄、谢毓章教授
地　点：二教会议室
时　间：八四年七月二日下午2:30

科学时报 SCIENCETIMES

科学周末 Science Weekend

2003年8月8日 星期五 第40期

摘下口罩后的思考

三年前的这个月份，本报正在筹办“2000年中国国际科普论坛”，一天，中国科协的一位领导告诉我们，一位从美国来的华裔大学教授早就动议要搞这样一个研讨会，并且与中国科协联系很长时间了。这人是谁，竟然能如此不谋而合？他就是我们在本文中要介绍的林磊先生，最后的结果是他不仅帮我们请到了国外的专家，作了大会发言，而且我们还建立了深厚的友谊。最近，他又从美国回来参加在杭州召开的学术会议，我们终于有机会探寻这位华裔科学家的人生历程。

■文／李元逸

剪不断的“中国情结”

——一个华裔科学家的人生历程

北美求学·投身“保钓”

再回美国·教书之外

放弃绿卡·回到祖国

■短讯

2003.08.08

林磊

广东→香港→加拿大→美国

→比利时→西德→北京→美国

BS 香港大学（1965）

MS 加拿大英属哥伦比亚大学

PhD 美国哥伦比亚大学（1973）

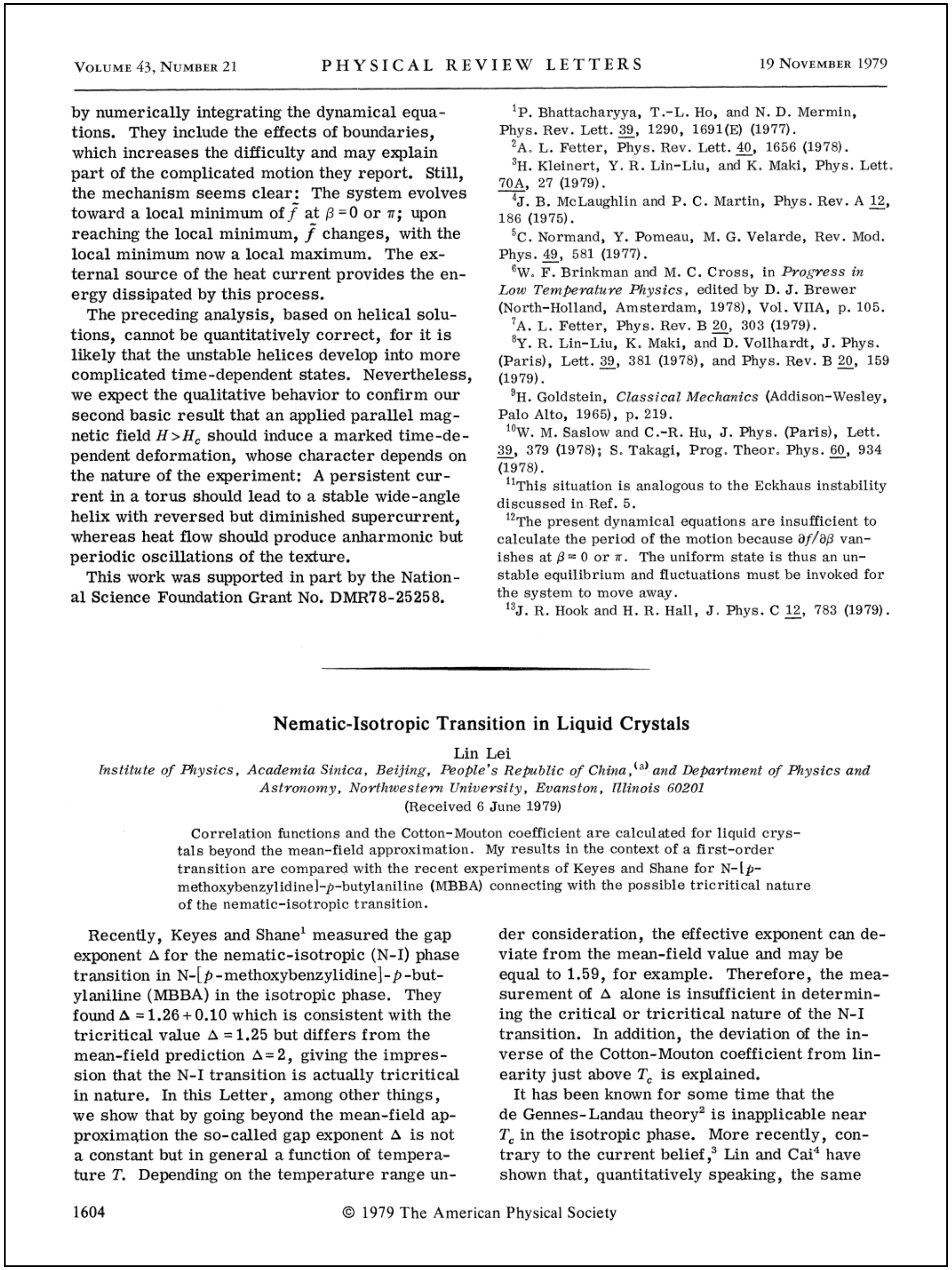
1978-1983 中科院物理所

第9代留学生、第2代海归

1978 物理所

1979

纯中国大陆作者的第1篇
*Physical Review Letters*文章



by numerically integrating the dynamical equations. They include the effects of boundaries, which increases the difficulty and may explain part of the complicated motion they report. Still, the mechanism seems clear: The system evolves toward a local minimum of $\tilde{f}$ at $\beta = 0$ or π; upon reaching the local minimum, $\tilde{f}$ changes, with the local minimum now a local maximum. The external source of the heat current provides the energy dissipated by this process.

The preceding analysis, based on helical solutions, cannot be quantitatively correct, for it is likely that the unstable helices develop into more complicated time-dependent states. Nevertheless, we expect the qualitative behavior to confirm our second basic result that an applied parallel magnetic field $H > H_c$ should induce a marked time-dependent deformation, whose character depends on the nature of the experiment: A persistent current in a torus should lead to a stable wide-angle helix with reversed but diminished supercurrent, whereas heat flow should produce anharmonic but periodic oscillations of the texture.

This work was supported in part by the National Science Foundation Grant No. DMR78-25258.

[1] P. Bhattacharyya, T.-L. Ho, and N. D. Mermin, Phys. Rev. Lett. 39, 1290, 1691(E) (1977).

[2] A. L. Fetter, Phys. Rev. Lett. 40, 1656 (1978).

[3] H. Kleinert, Y. R. Lin-Liu, and K. Maki, Phys. Lett. 70A, 27 (1979).

[4] J. B. McLaughlin and P. C. Martin, Phys. Rev. A 12, 186 (1975).

[5] C. Normand, Y. Pomeau, M. G. Velarde, Rev. Mod. Phys. 49, 581 (1977).

[6] W. F. Brinkman and M. C. Cross, in *Progress in Low Temperature Physics*, edited by D. J. Brewer (North-Holland, Amsterdam, 1978), Vol. VIIA, p. 105.

[7] A. L. Fetter, Phys. Rev. B 20, 303 (1979).

[8] Y. R. Lin-Liu, K. Maki, and D. Vollhardt, J. Phys. (Paris), Lett. 39, 381 (1978), and Phys. Rev. B 20, 159 (1979).

[9] H. Goldstein, *Classical Mechanics* (Addison-Wesley, Palo Alto, 1965), p. 219.

[10] W. M. Saslow and C.-R. Hu, J. Phys. (Paris), Lett. 39, 379 (1978); S. Takagi, Prog. Theor. Phys. 60, 934 (1978).

[11] This situation is analogous to the Eckhaus instability discussed in Ref. 5.

[12] The present dynamical equations are insufficient to calculate the period of the motion because $\partial f/\partial\beta$ vanishes at $\beta = 0$ or π. The uniform state is thus an unstable equilibrium and fluctuations must be invoked for the system to move away.

[13] J. R. Hook and H. R. Hall, J. Phys. C 12, 783 (1979).

Nematic-Isotropic Transition in Liquid Crystals

Lin Lei
Institute of Physics, Academia Sinica, Beijing, People's Republic of China,[a] *and Department of Physics and Astronomy, Northwestern University, Evanston, Illinois 60201*

(Received 6 June 1979)

Correlation functions and the Cotton-Mouton coefficient are calculated for liquid crystals beyond the mean-field approximation. My results in the context of a first-order transition are compared with the recent experiments of Keyes and Shane for N-[*p*-methoxybenzylidine]-*p*-butylaniline (MBBA) connecting with the possible tricritical nature of the nematic-isotropic transition.

Recently, Keyes and Shane[1] measured the gap exponent Δ for the nematic-isotropic (N-I) phase transition in N-[*p*-methoxybenzylidine]-*p*-butylaniline (MBBA) in the isotropic phase. They found $\Delta = 1.26 + 0.10$ which is consistent with the tricritical value $\Delta = 1.25$ but differs from the mean-field prediction $\Delta = 2$, giving the impression that the N-I transition is actually tricritical in nature. In this Letter, among other things, we show that by going beyond the mean-field approximation the so-called gap exponent Δ is not a constant but in general a function of temperature T. Depending on the temperature range under consideration, the effective exponent can deviate from the mean-field value and may be equal to 1.59, for example. Therefore, the measurement of Δ alone is insufficient in determining the critical or tricritical nature of the N-I transition. In addition, the deviation of the inverse of the Cotton-Mouton coefficient from linearity just above T_c is explained.

It has been known for some time that the de Gennes-Landau theory[2] is inapplicable near T_c in the isotropic phase. More recently, contrary to the current belief,[3] Lin and Cai[4] have shown that, quantitatively speaking, the same

1982

碗型液晶

林磊(2002).液晶相与分子“维数”.物理11卷3期171-178页

液晶的三种类别

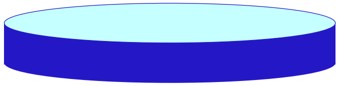
棒型

1888

奥地利

天然

Friedrich Reinitzer
(1857–1927)



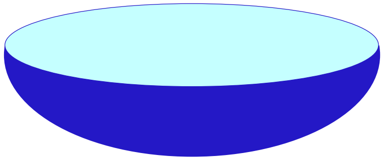
盘型

1977

印度

人工

Sivaramakrishna
Chandrasekhar
(1930–2004)



碗型

1982

中国

人工 (理论预言)

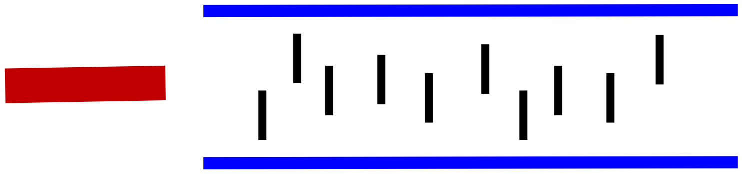
林磊

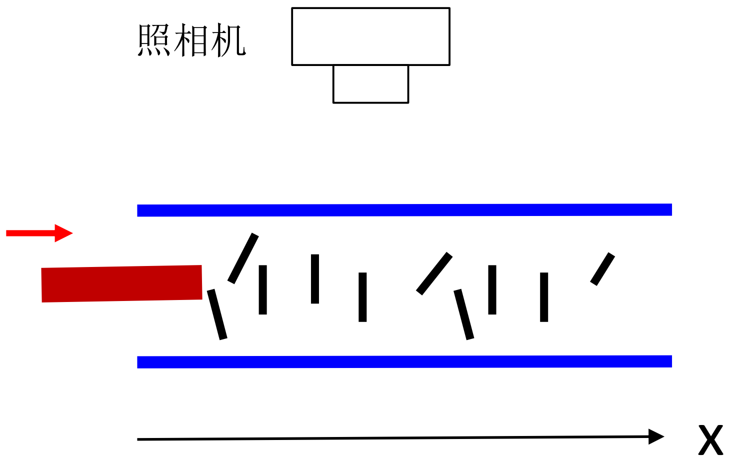
王良御

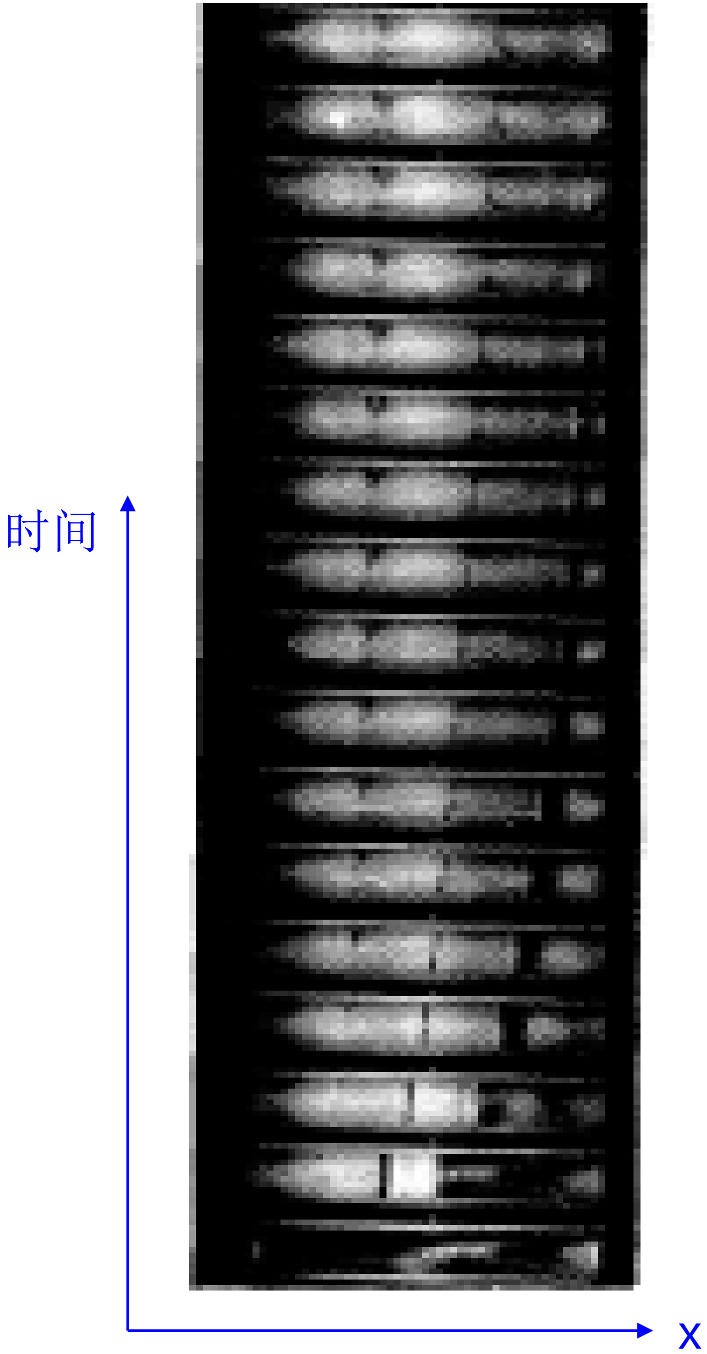
- 1982　硫型液晶在中国提出
- 1985　硫型液晶在欧洲合成
- 1988　王良御合成一种新的硫型液晶（发表于清华大学学报 ）

L. Y. Wang and X. F. Fei, J. Tsinghua University **28**(S4), 80 (1988)

诸国桢

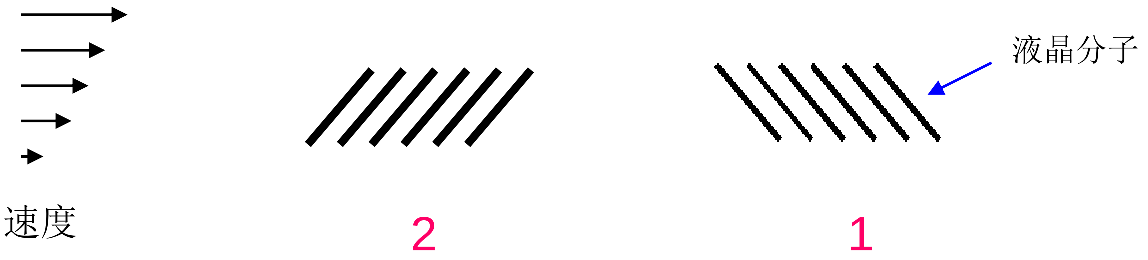




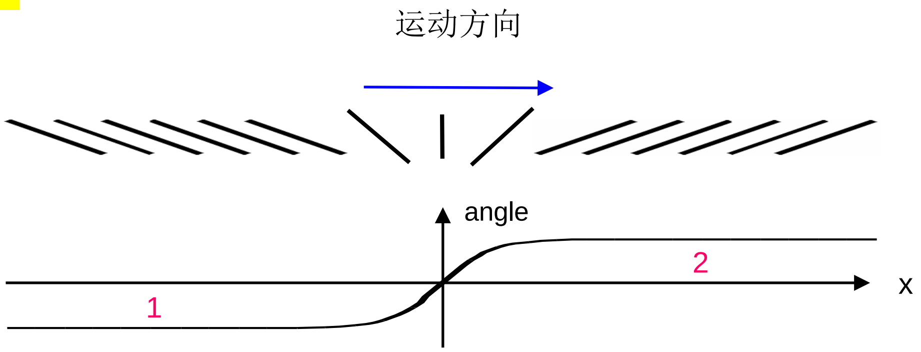


处于均匀切流状态的向列相液晶

液晶分子的两种可能排列



一个孤子



纯中国大陆作者的第2篇 *Physical Review Letters*文章（2篇并列）

universal coupling matrix element given by Olson and Salop[3] give essentially the same n values for the present cases.

In summary, we have shown that the electron capture from rare-gas targets by slow, highly charged ions proceeds very selectively, populating one or two main shells which are associated with the energy balance of the electronic levels according to a quasiresonant over-barrier transition. The n values populated agree well with the classical barrier model, although the use of a universal transition probability to predict cross sections from this model is shown to be inadequate.

We thank Dick MacDonald for substantial assistance in preparing the experiment and the SuperHILAC accelerator group for the excellent beam time. This work was partially supported by the Division of Chemical Sciences, U. S. Department of Energy.

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[a] On leave from Gesellschaft für Schwerionenforschung Laboratory, Postfach 110541, 6100 Darmstadt, West Germany.

[1] See "Electron Capture by Multiply Charged Ions," in *Electronic and Atomic Collisions, Invited Papers and Progress Reports*, edited by N. Oda and K. Takayanagi (North-Holland, Amsterdam, 1980), p. 387.

[2] R. Olson, Ref. 1, p. 391.

[3] R. E. Olson and A. Salop, Phys. Rev. A 14, 579 (1976).

[4] H. Ryufuku, K. Sasaki, and T. Watanabe, Phys. Rev. A 21, 745 (1980).

[5] R. Mann, F. Folkmann, and H. F. Beyer, J. Phys. B 14, 1161 (1981).

[6] Preliminary similar work on He targets by C^{+q} to O^{+q} projectiles has been reported by S. Ohtani, Y. Kaneko, M. Kimura, N. Kobayashi, T. Iwai, A. Matsumoto, K. Okuno, S. Takagi, H. Tawara, and S. Tsurubuchi, J. Phys. B 15, L535 (1982).

[7] H. F. Beyer, F. Folkmann, and R. Mann, Gesellschaft für Schwerionenforschung Report No. 81-25 (unpublished).

[8] R. Mann, H. F. Beyer, and F. Folkmann, Phys. Rev. Lett. 46, 646 (1981).

[9] E. L. B. Justiniano, Ph.D. thesis, Kansas State University, 1982 (unpublished); E. Justiniano, C. L. Cocke, T. J. Gray, R. D. DuBois, and C. Can, Phys. Rev. A 24, 2953 (1981).

[10] B. A. Huber, J. Phys. B 13, 809 (1980).

[11] E. Y. Kamber, D. Mathur, and J. B. Hasted, J. Phys. B 15, 263 (1982).

Experiments on Director Waves in Nematic Liquid Crystals

Zhu Guozhen
Department of Fundamental Courses, Tsinghua University, Beijing, China

(Received 7 May 1982)

In a homeotropic nematic cell, a solitarylike director wave is excited by a mechanical method. Three photographs of the wave propagation process and measured velocity-time dependence curves are presented. By means of the interference patterns of focused polarized light, it was found that the dark lines observed in white-light photographs correspond to a perpendicular alignment state of the director.

PACS numbers: 61.30.-v, 47.35.+i

Discussions about director waves began in 1968.[1,2] Leslie gave a good summary in 1979.[3] More recently, there have been two preliminary experimental reports on director waves by the author,[4,5] and a theoretical discussion by Lin and Shen.[6]

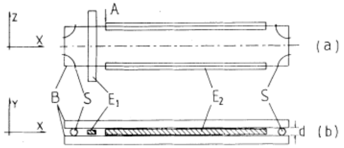

FIG. 1. A sketch of the liquid-crystal cell.

In these experiments, the liquid-crystal cell consists of two polished glass plates (B) of dimensions $0.5\times5\times30$ cm^3 (Fig. 1), with the cell thickness $d = 50 \pm 5$ μm, fixed by four spacers (S). E_1 is a Mylar film 20 μm thick, which serves as exciter. E_2 are Mylar films 30 μm thick for reducing the flow of liquid crystal in the z direction. The coordinate system used in later discussion is sketched on the left-hand side of Fig. 1. The arrow marked by A denotes the origin of

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Lin *et al.*[9] in which the dark lines are interpreted as solitons.

I am indebted to Yu Hao and Xu Laoli for designing and constructing the mechanical device used to push the exciter, Lin Lei for his interest in this work and his assistance in improving the English writing of this manuscript, Zhao Nanming for discussion at an earlier time, Professor J. L. Ericksen for telling me his recent view about director waves in a personal communication at my request, and finally, my teacher Professor Meng Chaoying for his encouragement.

[1] J. L. Fergason and G. H. Brown, J. Am. Oil Chem. Soc. 45, 120 (1968).

[2] J. L. Ericksen, J. Acoust. Soc. Am. 44, 444 (1968).

[3] F. M. Leslie, in *Advances in Liquid Crystals*, edited by G. H. Brown (Academic, New York, 1979), Vol. 4.

[4] Zhu Guozhen, J. Qinghua Daxue Xuebao 21(4), 83 (1981).

[5] Zhu Guozhen, in Proceedings of the Chinese Liquid Crystal Conference, Guilin, China, 20–25 October 1981 (to be published).

[6] Lin Lei and Shen Juelian, in Proceedings of the Chinese Liquid Crystal Conference, Guilin, China, 20–25 October 1981 (to be published).

[7] Zhu Guozhen *et al.*, to be published.

[8] M. Born and E. Wolf, *Principles of Optics* (Pergamon, New York, 1975).

[9] Lin Lei *et al.*, following Letter [Phys. Rev. Lett. 49, 1335 (1982)].

Soliton Propagation in Liquid Crystals

Lin Lei,[a] Shu Changqing, and Shen Juelian
Institute of Physics, Chinese Academy of Sciences, Beijing, China

and

P. M. Lam
Institute of Theoretical Physics, Chinese Academy of Sciences, Beijing, China

and

Huang Yun
Department of Physics, Beijing University, Beijing, China

(Received 5 May 1982)

Soliton propagation in nematic liquid crystals under shear is shown to be possible and studied theoretically. Calculations including those pertaining to the modulation of monochromatic or white light passing through such a liquid-crystal cell are presented. Recent experiments are interpreted accordingly and are in good agreement with the theory presented here.

PACS numbers: 61.30.-v, 03.40.Kf, 05.70.Ln, 47.15.-x

Solitons are important and have been found in various objects ranging from celestial bodies to laboratory systems.[1,2] However, unlike the first observation of solitons in shallow water by Scott Russell, many of the recent experimental evidences of solitons in condensed matter are indirect in nature. The experiments[3] on the ordered fluid ^{3}He are no exception. In this regard, we note that in another type of ordered fluid, viz., liquid crystal, because of the strong coupling of the director with light, it may be possible to observe the motion of the molecules and the solitons rather directly.

Discussions of solitons in liquid crystals[4] was first given by Helfrich[5] and subsequently by de Gennes,[6] Brochard,[6] and Leger.[7] In their work in nematics, the solitons (called "walls") are magnetically generated and are small in width (e.g., a few microns). Experimentally, the observation[7] of these solitons is delicate and a polarizing microscope has to be used. Recently, there has been more but still limited attention[8] paid to the role of solitons in the physics of liquid crystals.

In this Letter, we first point out and discuss a new case in liquid crystals, viz., nematics under uniform shear, in which solitons can exist and propagate. In contrast to the magnetic case[5-7]

院系调整后的清华物理学科（1952-1982）

1976年文化大革命结束，次年全国恢复高考制度。1978年在文革期间中断的四个研究班复班，分散在各处的原研究班师生再次集中起来。清华大学于1978年和1979年开始招收硕士和博士研究生。这些能够招收研究生的专业中属于物理学科的有光学（物理教研组）、理论物理（工物系）、核物理（工物系）和固体物理（工物系，成立于1980年）。

文革结束后的几年中，工物系和物理教研组的科研工作都有了稳步的提高。光学、加速器、核物理教研组的研究成果曾获得一系列科研奖励。1982年超声波研究组诸国桢的研究工作发表在Physical Review Letters上，成为清华大学物理系成立以来第一篇发表在该刊物的论文。

林磊液晶组发表的液晶孤子论文

与物理所学生共同发表的

1982	1
1984	1
1985	5
1986	2
1987	1

与南京师范大学合作的

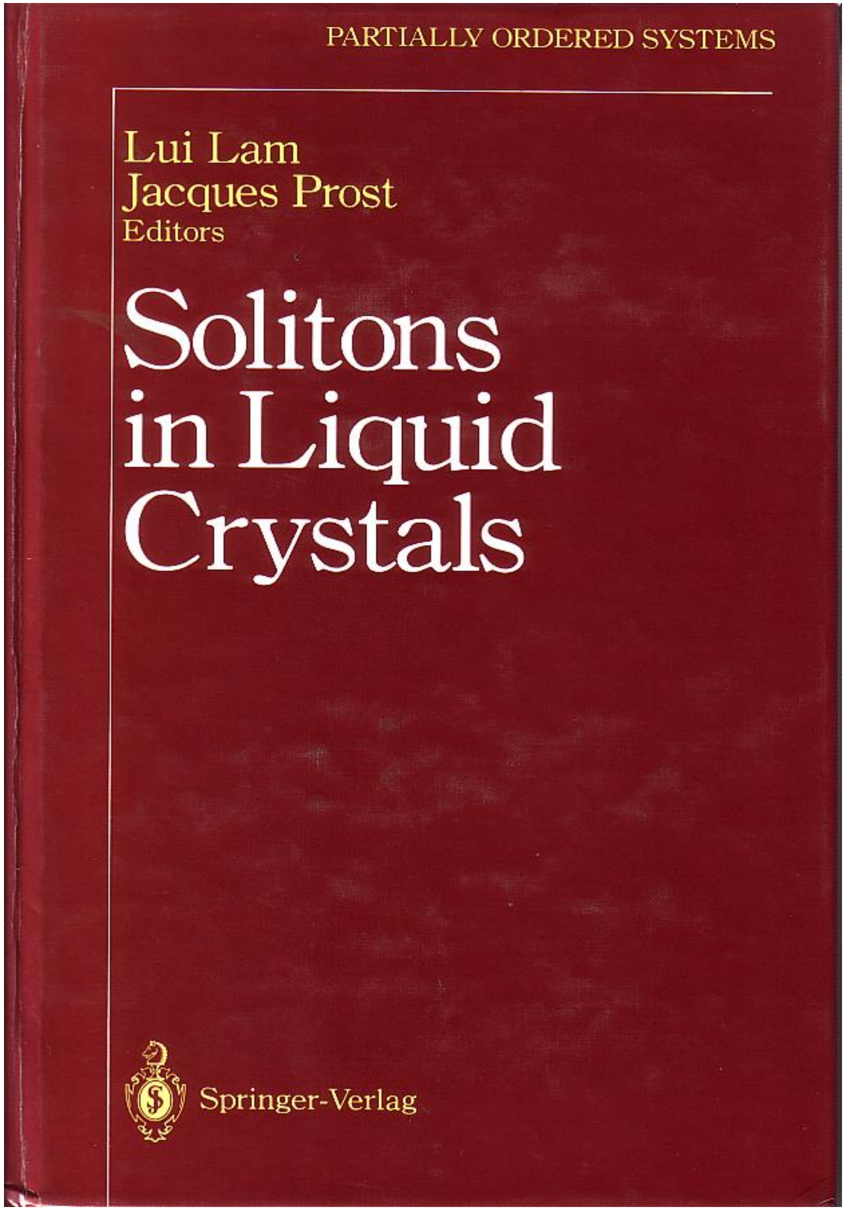
1986	1
1987	4
1988	2

- 一篇博士论文（舒昌清，1984）
- 一篇硕士论文（何刚，1986）

总数（包括与圣何塞州立大学学生共同发表的和综述论文）

23 篇论文（在12种期刊上发表）

Physical Review Letters
物理学报
Chinese Physics
Physics Letters A
Journal of Mathematical Physics
Journal of Statistical Physics
Molecular Crystals and Liquid Crystals
Molecular Crystals and Liquid Crystals Letters
南京师范大学学报（自然科学）
Physical Review A
Liquid Crystals
Chaos Solitons Fractals



PARTIALLY ORDERED SYSTEMS

Lui Lam
Jacques Prost
Editors

Solitons
in Liquid
Crystals

Springer-Verlag

1992

林磊与清华大学合作的文章

1. 谢毓章, 欧阳钟灿 and 林磊, “Electric Field Effects on the Elastic Constants of Nematics. I.” *Mol. Cryst. Liq. Cryst*. **101**, 19 (1983).

2. 谢毓章 and 林磊, “Brief Report on the 1981 Chinese Liquid Crystal Conference”, *Mol. Cryst. Liq. Cryst*. **91**, 93 (1983)

3. 林磊 and 赵静安, “液晶”, in 《中国大百科全书 - 物理卷》 (Chinese Encyclopedia Press, Beijing, 1987).

4. 赵静安 and 林磊, “液晶理论”, in 《中国大百科全书 - 物理卷》 (Chinese Encyclopedia Press, Beijing, 1987).

5. 林磊, 欧阳钟灿 and M. Lax, “*Ab Initio* Theory of Linear and Nonlinear Optics of Liquid Crystals”, *Phys. Rev. A* **37**, 3469 (1988).

学会组织

物理通讯

增刊 VII

全国液晶学术会议

1979年6月29日至7月3日

上海

阮亮

中国科学院物理研究所
图书情报资料室
1979

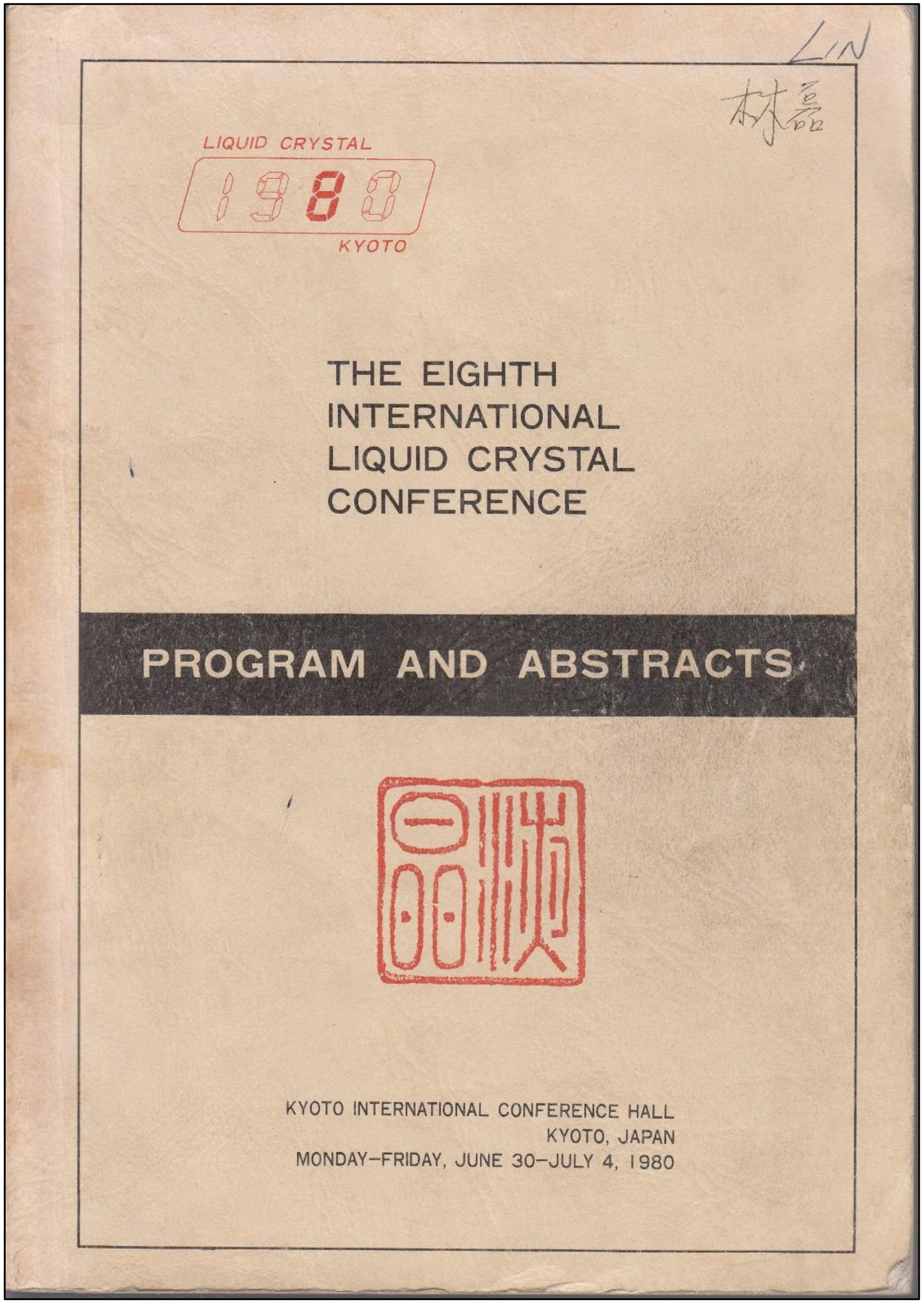
目录

1980

6月-7月, 日本京都

8th International Liquid Crystal Conference

- 中国大陆科学家参加的 International Liquid Crystal Conference 系列中的第一个
- 林磊被提名进 International Planning and Steering Committee



LIN

林磊

LIQUID CRYSTAL

1980

KYOTO

THE EIGHTH
INTERNATIONAL
LIQUID CRYSTAL
CONFERENCE

PROGRAM AND ABSTRACTS

KYOTO INTERNATIONAL CONFERENCE HALL
KYOTO, JAPAN
MONDAY–FRIDAY, JUNE 30–JULY 4, 1980

1980 中国液晶学会在北京成立

理事长:谢毓章　付理事长:赵静安、林磊　秘书:林磊、阮亮

1981年中国液晶学术会议留影 于桂林

LCS CENTENARY
CHINA 6.27—7.1′ 88

液晶发现百周年纪念会议

CENTENARY CONFERENCE
OF
LIQUID CRYSTAL DISCOVERY

1888—1988

中国液晶学会

液晶发現
百周年纪念會

签到簿

中國液晶学會

1988·6于北京

R. Lierau

R. LIERAU
HOFFMANN-LA ROCHE
BASEL /SWITZERLAND

S. Kobayashi
Tokyo Univ. of
Agri. & Tech
Koganei, Tokyo 184
Japan.

陈志成
香港罗氏公司

北京化学试剂研究所

樊邦棣

南京二十八研究所	陈洋
华中理工大学物理系	贺[illegible]龙
东南大学理化系	馮洛瑜
武钢第一职工医院	杨秀逵
武钢一技校	胡 [illegible]
大连理工大学	任国度
" " " "	王家儒
武汉大学生物系	柳保全
清华大学	何慧
北京地质仪器厂	李鸣年

Lajos BATA

Central Research Institute
for Physics.

Hungarian Academy of Sciences

Budapest

Hungary.

Hideo TAKEZOE
Tokyo Institute of Technology
Department of Organic and
Polymeric Materials
TOKYO, Japan

S. Chandrasekhar (Raman Research Institute
Bangalore, INDIA)

G Durand Physique des Solides
Orsay France

L. Lam (林磊) San Jose State U.
CA, USA

战之信 南开大学

黄子尼 成都电讯工程学院 五系

冷翠秋 上海合成纤维研究所

張盛載 广州市光学应用研究所

潘西平 上海电真空器件研究所

張磊 上海电真空器件研究所

[illegible] 湖州玻璃厂

M. Schadt, F. Hoffmann-La Roche
Basle, Switzerland

国营第770厂 徐国绥 技术处副处长
技术处 刘翠兰

机械电子部 仉志荣
三所

北师大 杨春韶

南开大学 乔利军

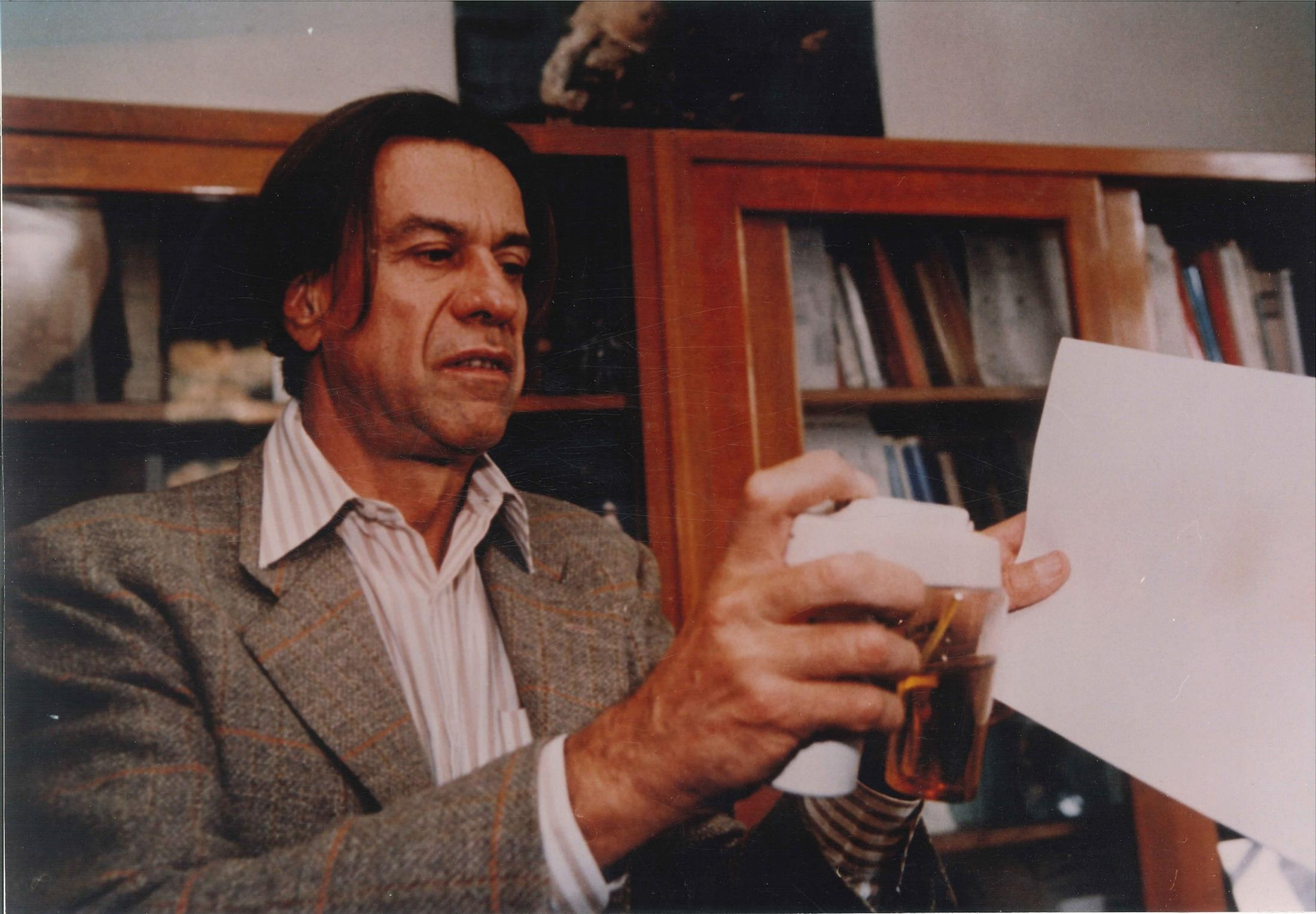
清华大学 刘永倩

东南大学 陈书澈

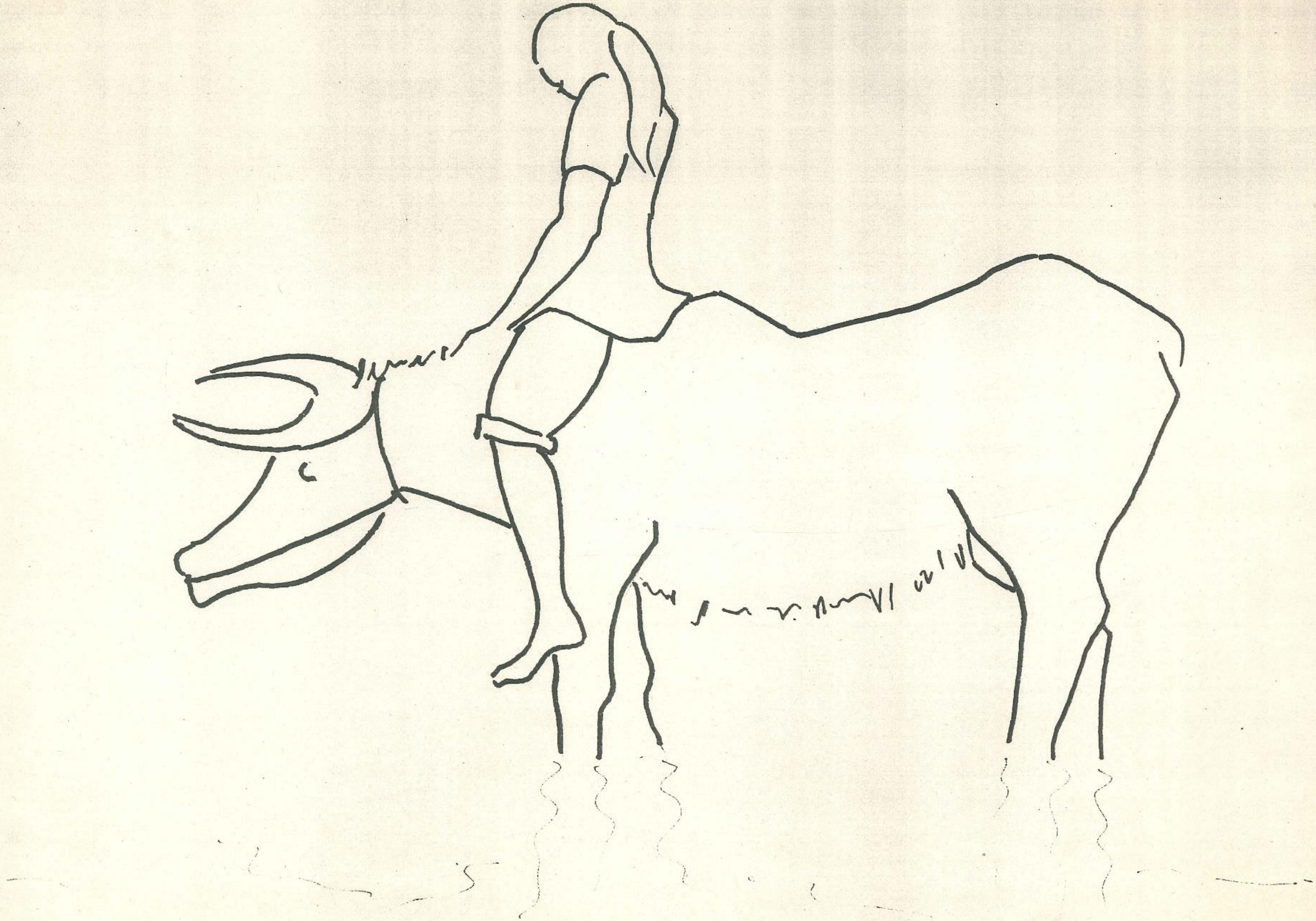
七七四厂 万传家

G. Barbero, Politecnico di Torino
C.Duca degli Abruzzi 24
TORINO, I-10129 Italy

山师大 孙惠良



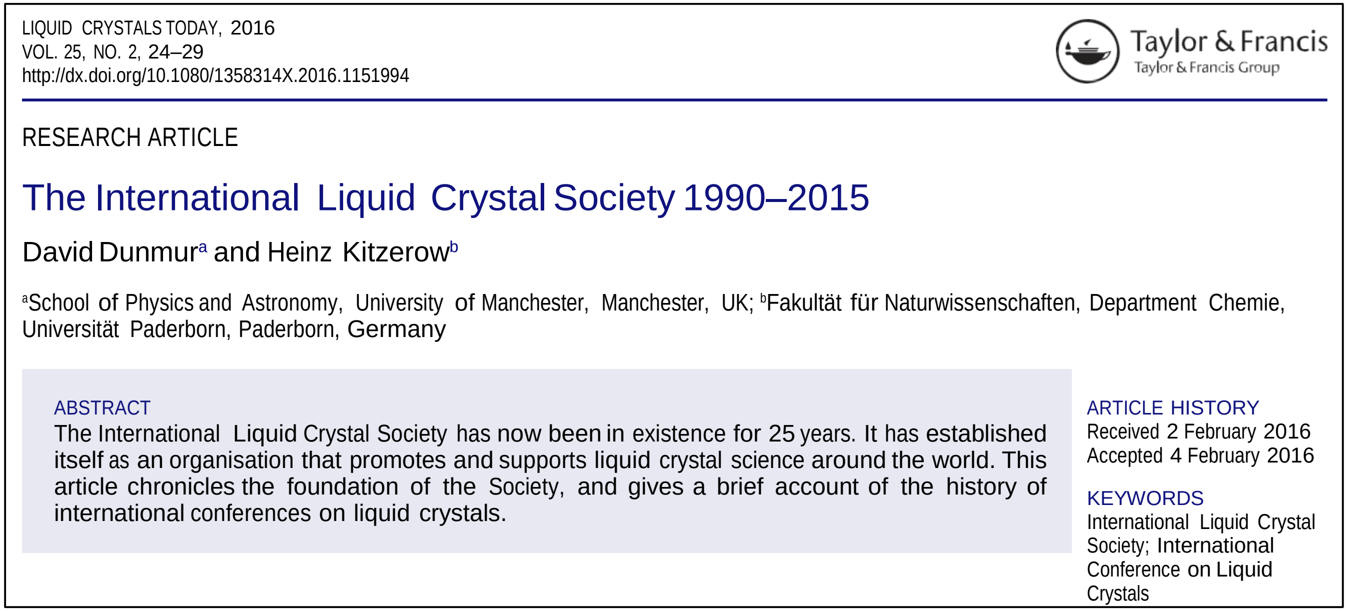
De Gennes 不能来，寄来本人照片及…



Szechuan Mai 88

De Gennes 画作一张

1990 国际液晶学会在温哥华成立



LIQUID CRYSTALS TODAY, 2016
VOL. 25, NO. 2, 24–29
http://dx.doi.org/10.1080/1358314X.2016.1151994

RESEARCH ARTICLE

The International Liquid Crystal Society 1990–2015

David Dunmur[a] and Heinz Kitzerow[b]

[a]School of Physics and Astronomy, University of Manchester, Manchester, UK; [b]Fakultät für Naturwissenschaften, Department Chemie, Universität Paderborn, Paderborn, Germany

ABSTRACT

The International Liquid Crystal Society has now been in existence for 25 years. It has established itself as an organisation that promotes and supports liquid crystal science around the world. This article chronicles the foundation of the Society, and gives a brief account of the history of international conferences on liquid crystals.

ARTICLE HISTORY
Received 2 February 2016
Accepted 4 February 2016

KEYWORDS
International Liquid Crystal Society; International Conference on Liquid Crystals

Prehistory of International Liquid Crystal Society, 1978-1990: A Personal Account

Lui Lam

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Abstract: A personal account of the liquid crystal community (1978-1990s) and the founding of the International Liquid Crystal Society (1987-1990) is presented. The founding process was unlike that of many other learned societies but like other historic events, it resulted from a combination of necessity and contingency.

1. Introduction

I was the one who initiated and orchestrated the founding of the International Liquid Crystal Society (ILCS) [1]. The ILCS replaced The Planning and Steering Committee for International Liquid Crystal Conferences (PSC for ILCC) in 1990. To understand how and why this happened we have to go back to the beginning of the PSC.

MOLECULAR CRYSTALS AND LIQUID CRYSTALS 2017, VOL. 647, 351-372 http://dx.doi.org/10.1080/15421406.2017.1289627

结论

- 在简陋的条件下，可以做出世界一流水平、创新的研究工作（西南联大的经验说明，在更差的条件下可以训练出一流的学生）。关鍵是:
  - 选题（敢想、敢做）
  - 不数文章（无急出、多出文章压力）
- 我国在1970和1980年代的液晶研究，突显了本土科学家与海归第一代（1950年代回国）和第二代（1978年前后回国）科学家在一流科学管理下的融洽協作

液晶

棒形	盘形	碗形
1888	1977	1982
奥地利	印度	中国（物理所）

超导体

BCS 型	铜基型	铁基型
1911	1986	2006
荷兰	瑞士	日本

- 清华大学在1980年代早已建立了一个世界一流的学科：液晶研究
- 希望我国科学史学者多关注国内近期的科研历史
- 希望清华科史系有学生做个我国早期液晶研究的硕士论文
- 希望清华科学博物馆会保存清华液晶研究的历史文物


熊知行樓
清華大學
老年学研究中心


清华大学银星台球协会
TSINGHUA UNIVERSITY SILVER STAR BILLIARDS SOCIETY
清华大学离退休工作处
二〇一六年八月
清华老年台球俱乐部年终大赛
清华老年台球俱乐部
09清华台球俱乐部年终个人赛

清华大学70和80年代的液晶研究

林磊

美国加州圣何塞州立大学、中国科学院物理研究所、中国科学技术协会科普研究所

液晶于1888年在欧洲发现。在1960年代末至1980年代末，由于法国南巴黎大学Pierre-Gilles de Gennes和美国哈佛大学Paul Martin等理论物理学家的介入，液晶研究成为显学。de Gennes 于1991年獲诺贝尔奖。在应用方面，自1970年液晶显示发明后，特别是液晶电视于1988年面世以来，液晶显示已是全球年产千亿美元的重要产业，去年中国液晶面板产量位居全球第二，今年有望成为全球第一。我国的液晶研究始于文革期间的1960年代末，几与国际同步。在1967年青蒿素攻关大協作开始后两年，清华组织了一个跨学科、跨单位的液晶电视攻克小组，于1976年初步成功，屏幕显示速度達标，领先全球。1978年改革开放、高考恢复后，清华基础部成立了液晶物理研究组，在液晶教学、人材培养方面成为全国之重，并在液晶基础研究方面作出贡献。比如，清华于1982年发表了*Physical Review Letters*上我国（纯我国作者）的第二篇文章（两篇之一），合成了（于1982年由我国发明的）碗形液晶的一个新品种，出版了在华人液晶界倍受欢迎、唯一的、中文液晶物理教科书，培养了一个中国科学院院士。清华与中科院物理所联手，在1980年代把中国的液晶研究迅速提升到世界一流水平，在校内建成了一个"一流学科"。在学会组织方面，清华于1980年牽头成立了中国液晶学会（世界上第一个全国液晶学会，比英国液晶学会早5年），影响了后来由中国人于1990年建立的国际液晶学会。我国在1970和1980年代的液晶研究，突显了本土科学家与海归第一代（1950年代回国）和第二代（1978年前后回国）科学家在一流科学管理下的融洽協作，对当前科技创新、建设"双一流"大学的啓示，將于文末讨论。