



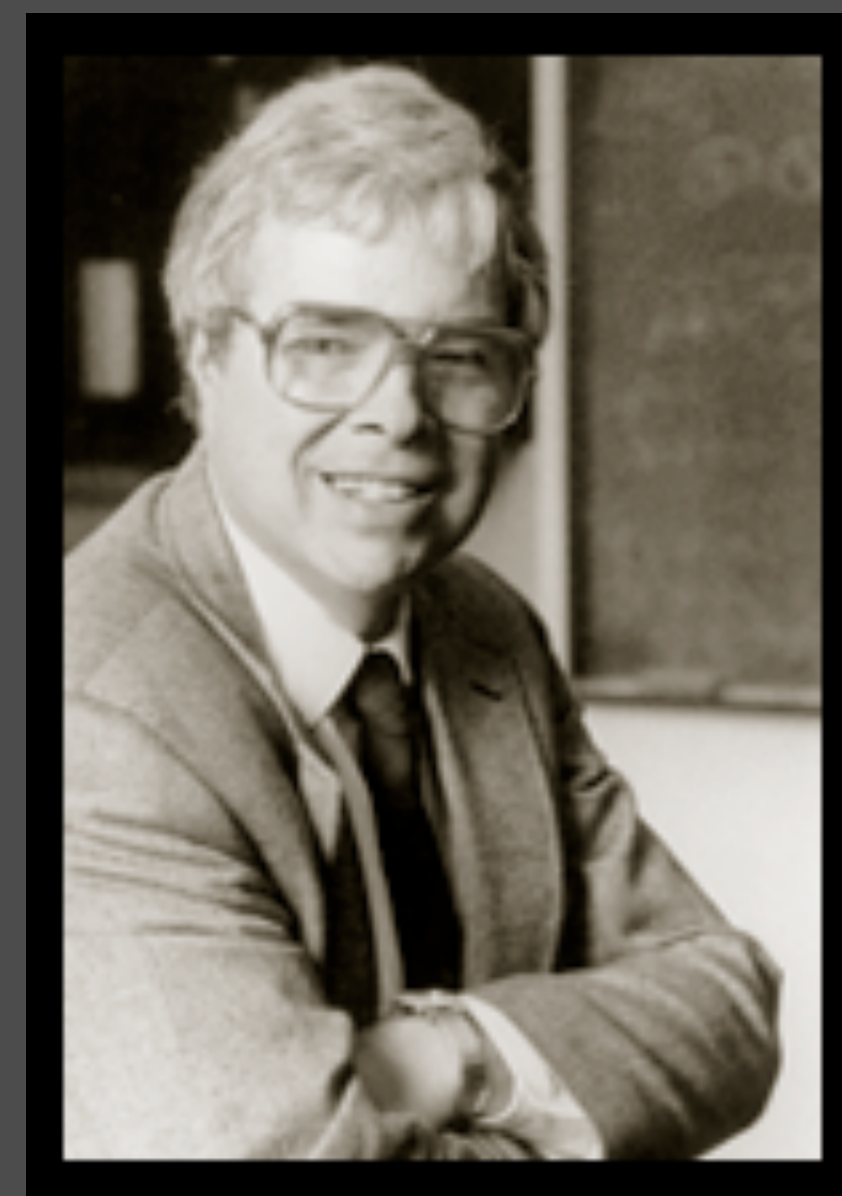
Kenneth G. Wilson Award for Excellence in Lattice Field Theory

To recognize outstanding contributions in lattice field theory

The prize is given annually and will consist of a certificate citing the contributions of the recipient, a modest monetary award, and an invitation to present the cited work in a short plenary talk at the *International Symposium on Lattice Field Theory*. The registration fee for the conference will be waived.

This award recognizes outstanding physicists who are within seven years of PhD at the time of nomination, plus any career breaks. The research recognized could either be a single piece of work, or the sum of contributions.

IAC subcommittee: A. Kronfeld; K. Jansen, N. Christ; Ph. de Forcrand, S. Hashimoto, J. Shigemitsu; D. Leinweber, P. Vranas, H. Wittig.





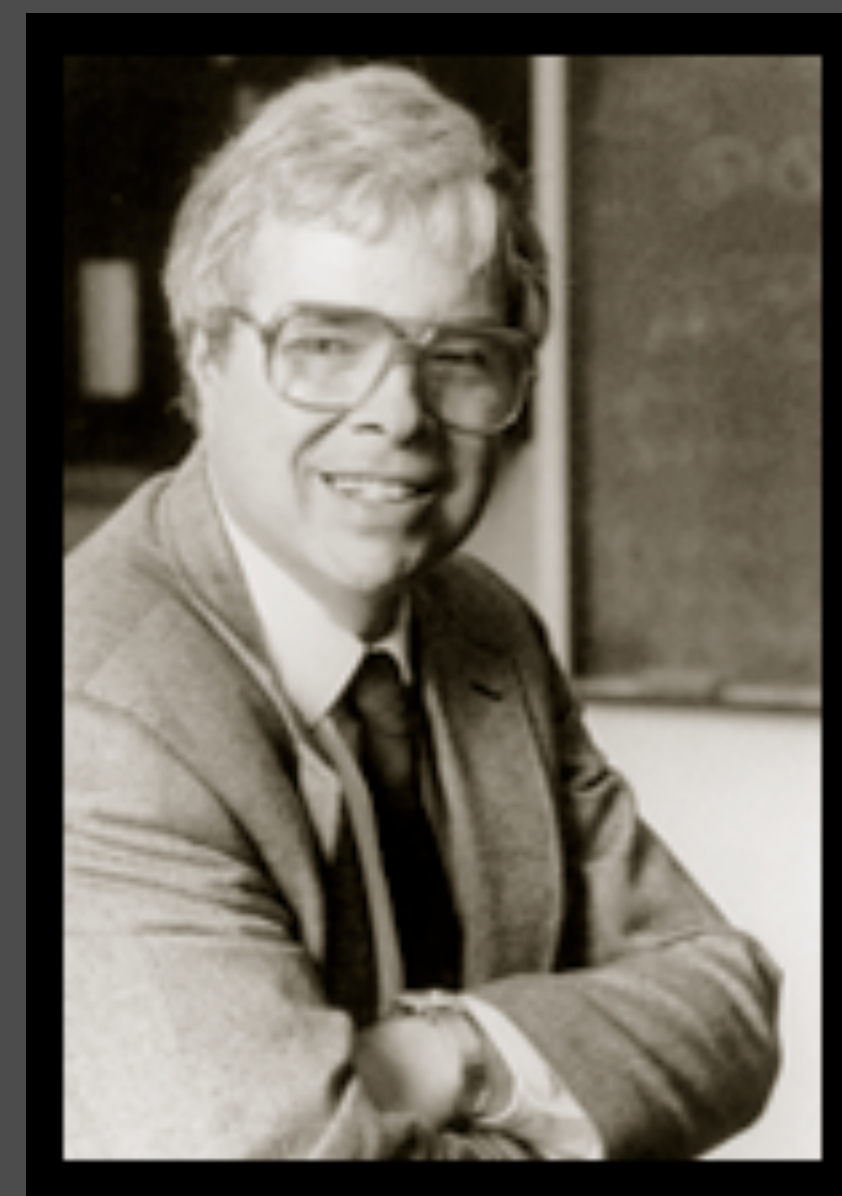
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Nominations should consist of a nominating letter, a seconding letter, and up to two supporting letters; the nominee's CV; and a list of relevant publications (up to ten). The nominating letter should include a proposed citation (one sentence) justifying the award. All letters should explain and justify why the nominee should receive the award. Nominations will be considered for three years (or until receiving the award).

Self-nominations will not be considered. Otherwise, anyone may submit a nomination. Recipients are not eligible for a second award. Nominations of scientists from all nations are solicited.

For nominations submitted for the 2013 award, nominees must have received a PhD (or equivalent) after December 31, 2005 (with suitable adjustment in cases with career breaks).

The 2013 Selection Committee consists of: Andreas Kronfeld (Chair), Shoji Hashimoto, Karl Jansen (2011 recipient), Stephen Sharpe (Vice-Chair), Maria Paola Lombardo.



Kenneth Geddes Wilson

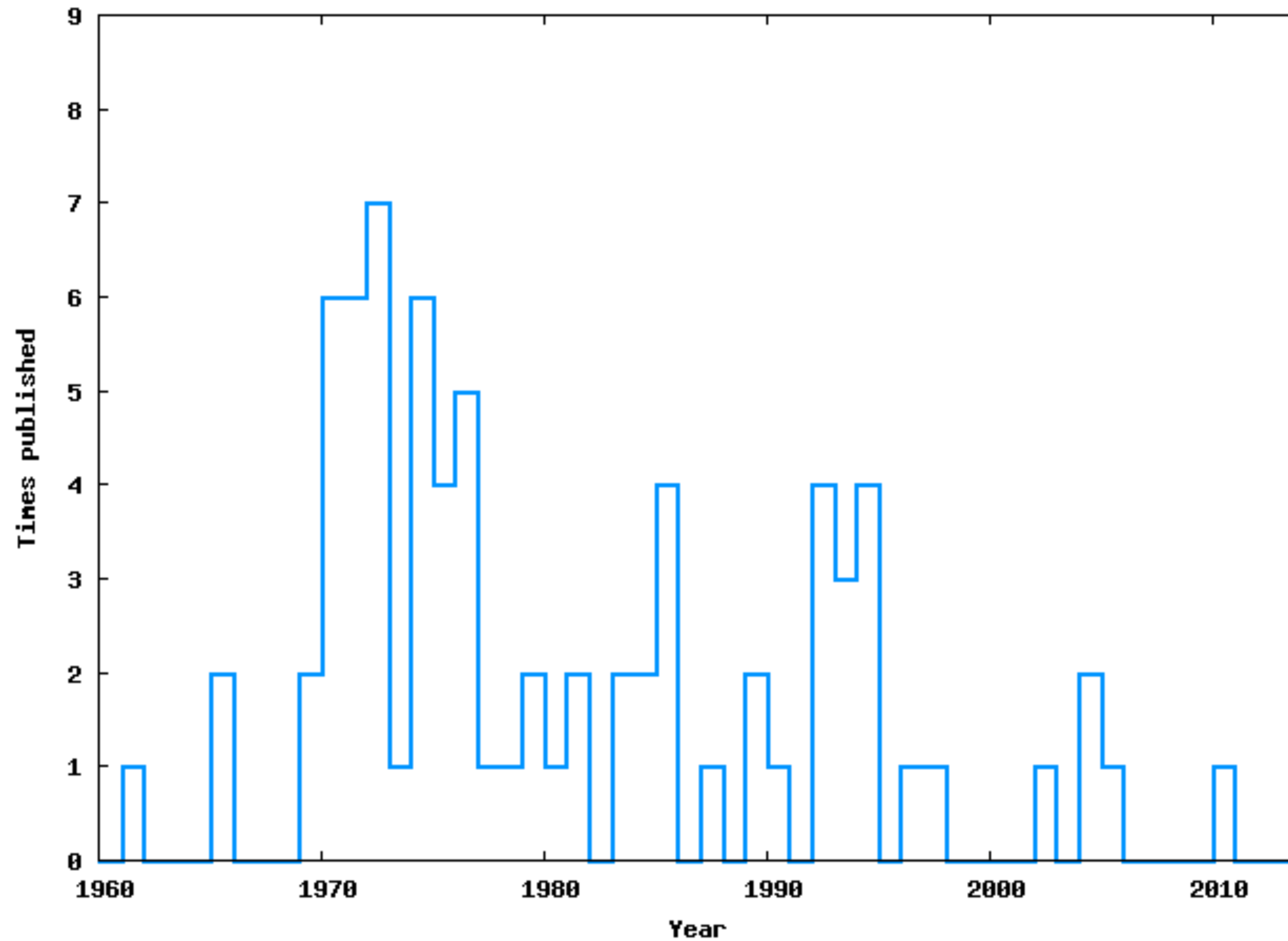
*June 8, 1936, in Waltham, Massachusetts

†June 15, 2013, in Saco, Maine

Education and Career

- The George School, 1952
- Harvard University, AB, 1956
- CalTech, PhD, 1961 (under Murray Gell-Mann)
- Harvard Society of Fellows, 1959-1962
- CERN, 1962-1963
- Cornell University, 1963-1987
- The Ohio State University, 1988-2008

Quality *vs.* Quantity



Operator-Product Expansions

scale invariance

$$A(x)B(y) = \sum_n C_n(x-y) O_n(x)$$

anomalous dimensions

Wilson coefficients



Critical Phenomena

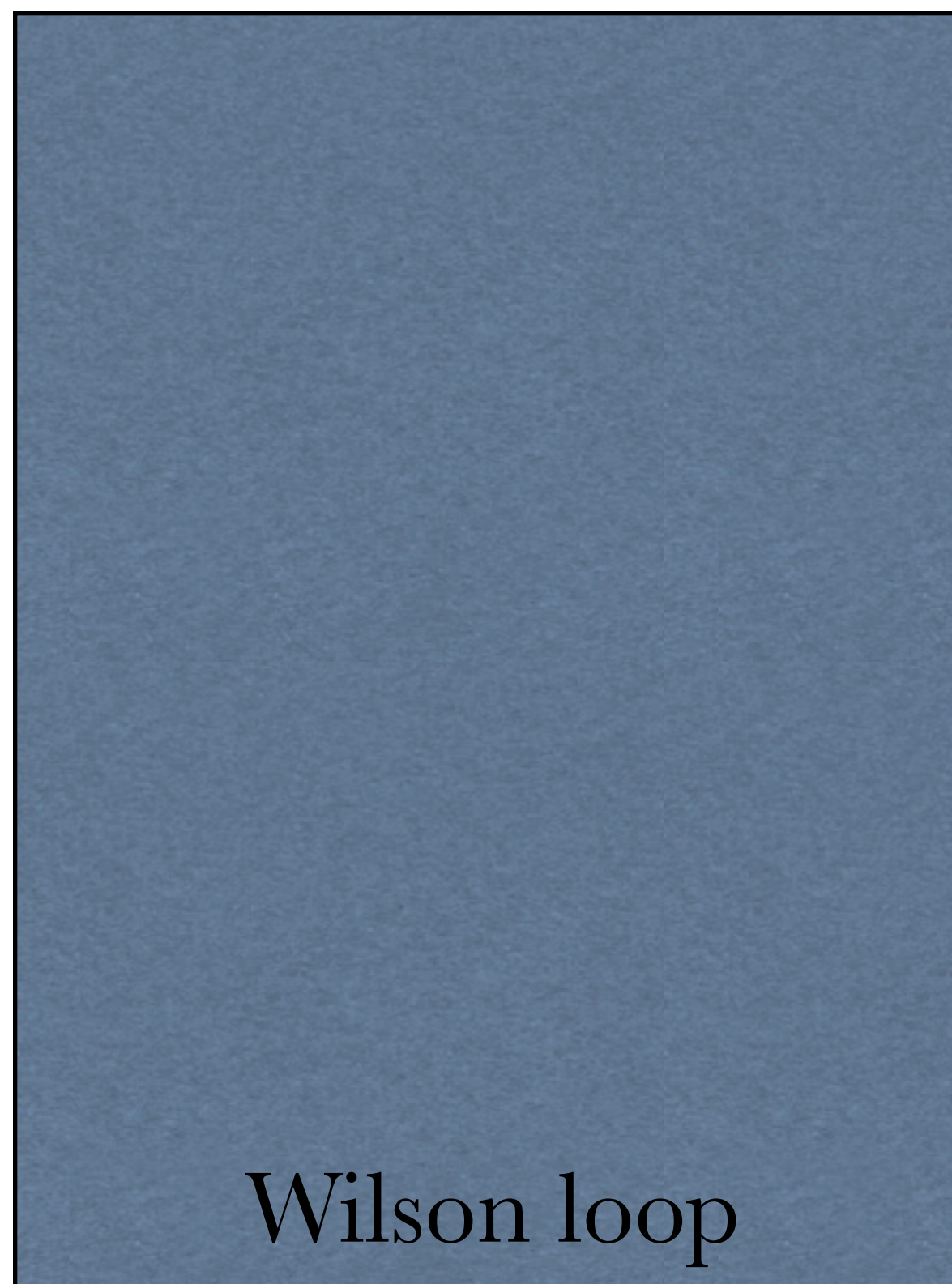
1971–1975

Equations (9) and (10) are the renormalization-group equations suggested by the Kadanoff block [spin] picture.

To derive the recursion formula, the variables $\sigma_L(\mathbf{k})$ for $0.5L < |\mathbf{k}| < L$ will be **integrated out**.

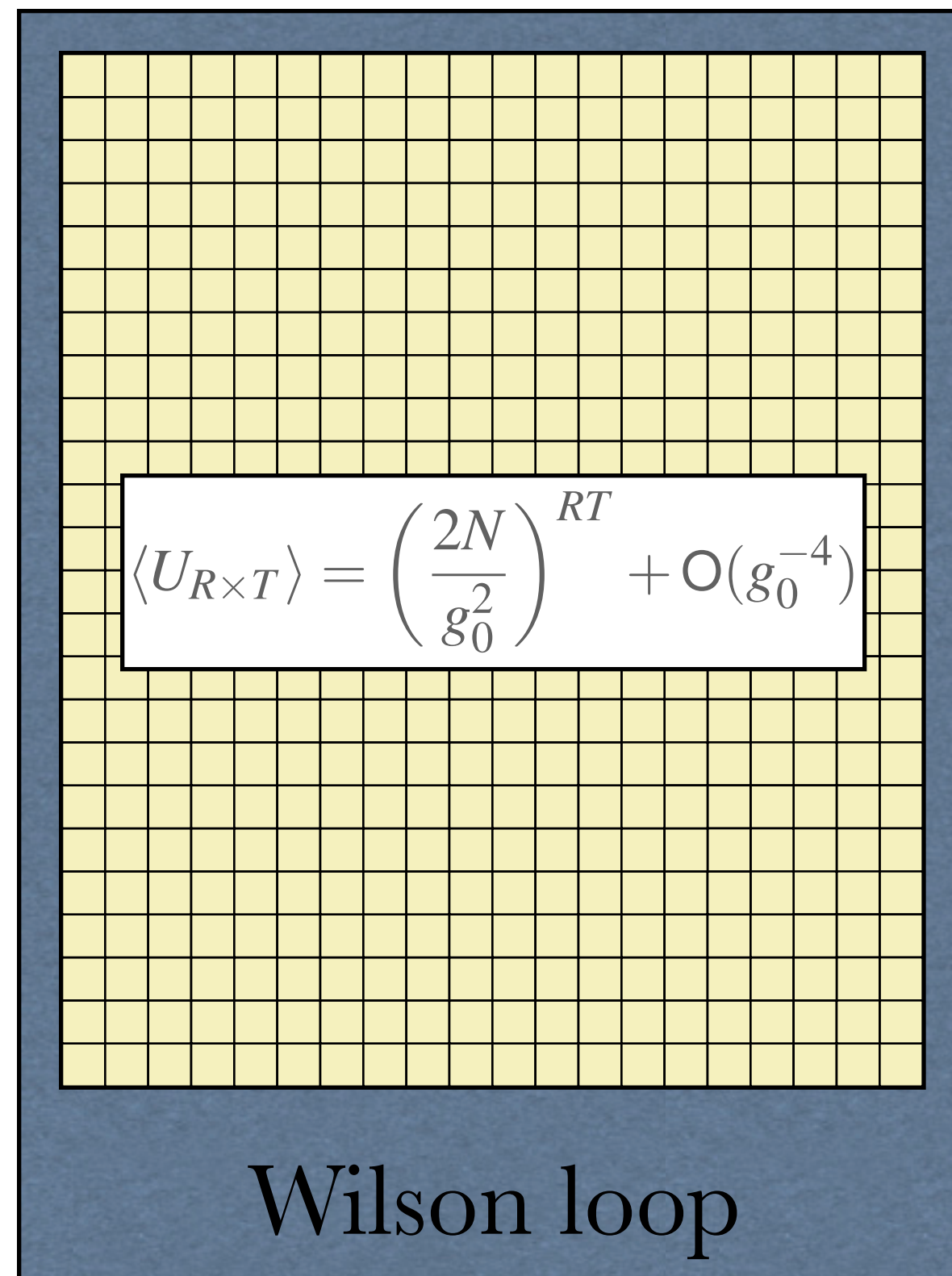
Confinement of Quarks

1974



Confinement of Quarks

1974



The Kondo Problem

1974

If a particular parameter in the initial Hamiltonian causes amplification (*i.e.*, λ_i is greater than 1), it is called a “**relevant variable**.” A parameter whose effect is deamplified is called “**irrelevant**.” ...

A **marginal** variable is one which is neither amplified nor deamplified by a renormalization group transformation. ...

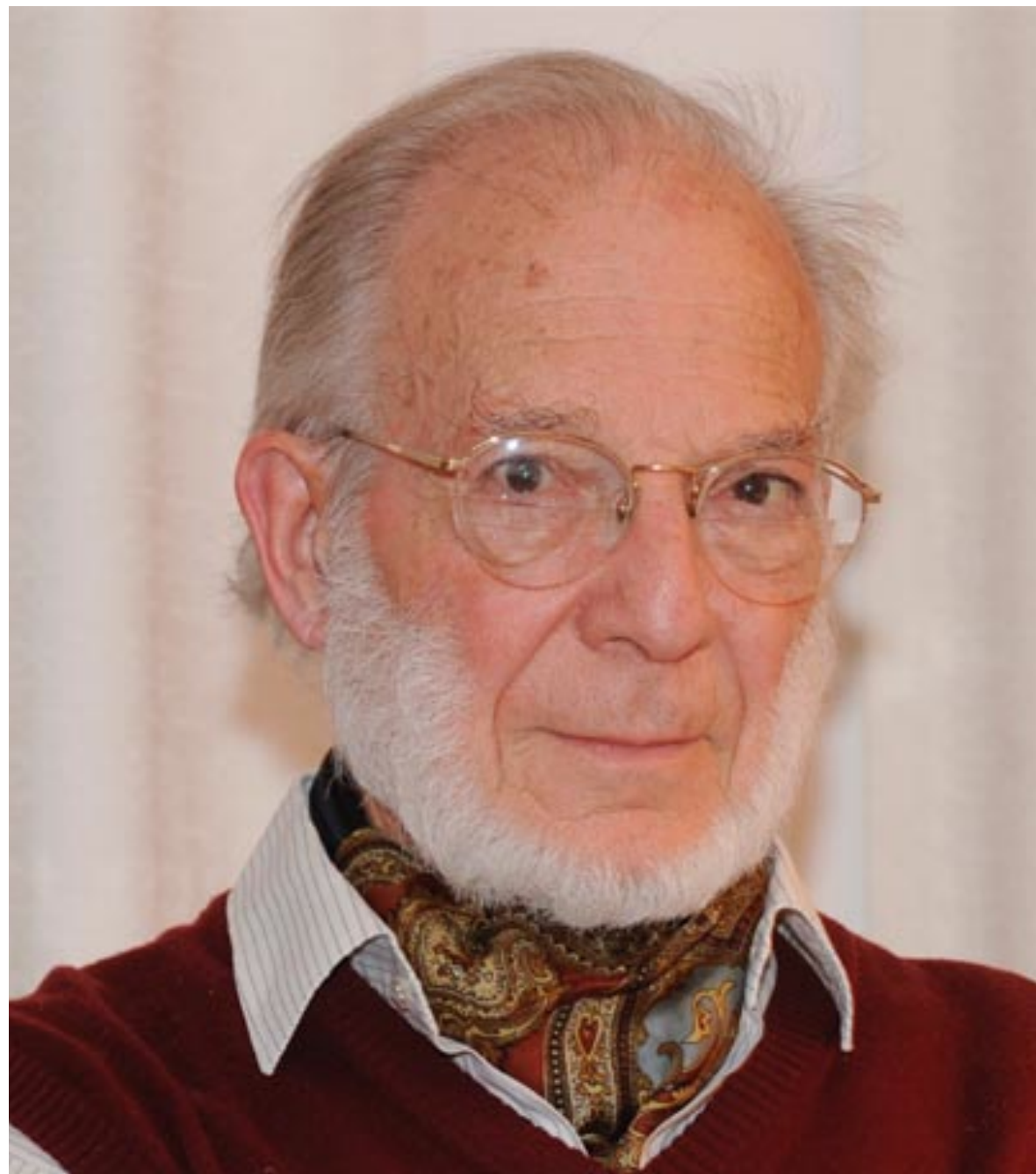
[T]he field theoretic methods of Gell-Mann and Low and Callan and Symanzik are based entirely on the special behavior of marginal variables.

Effective Field Theory

- The Wilsonian RG leads naturally to a concept of effective field theory: a (perhaps slightly) different QFT at every scale.
- Weinberg introduced a related concept, based on unitarity, analyticity, and cluster decomposition.
- Symmetries and universality emerge at long distances.
- Yet, authors whose reasoning draws on Weinberg's concept still use Wilson's language of "integrating out degrees of freedom."

Wolf Prize in Physics, 1980

for pathbreaking developments culminating in the general theory of the critical behavior at transitions between the different thermodynamic phases of matter.



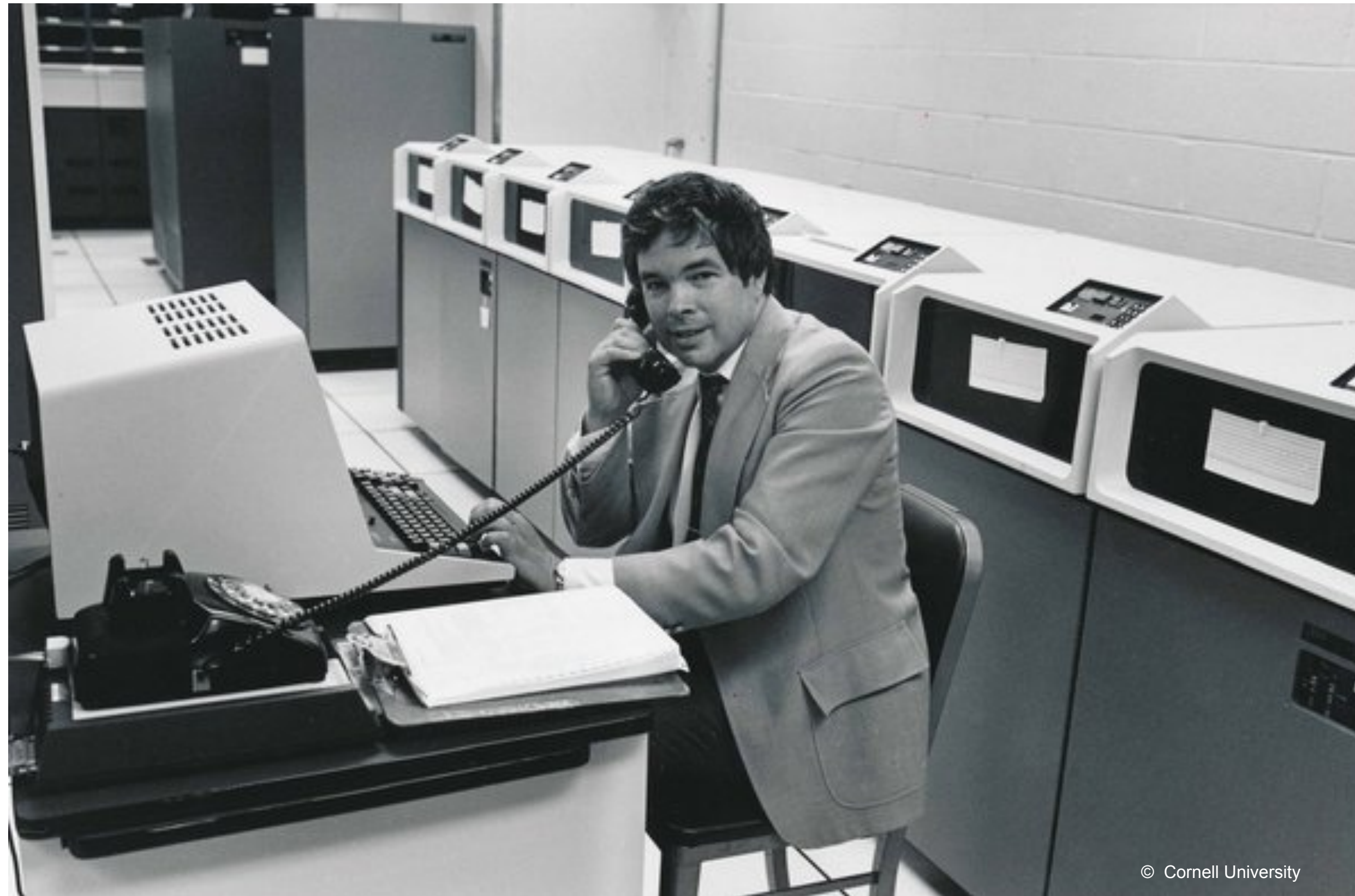
Nobel Prize in Physics, 1982

for his theory for critical phenomena in connection with phase transitions.



Computational Science

1979–



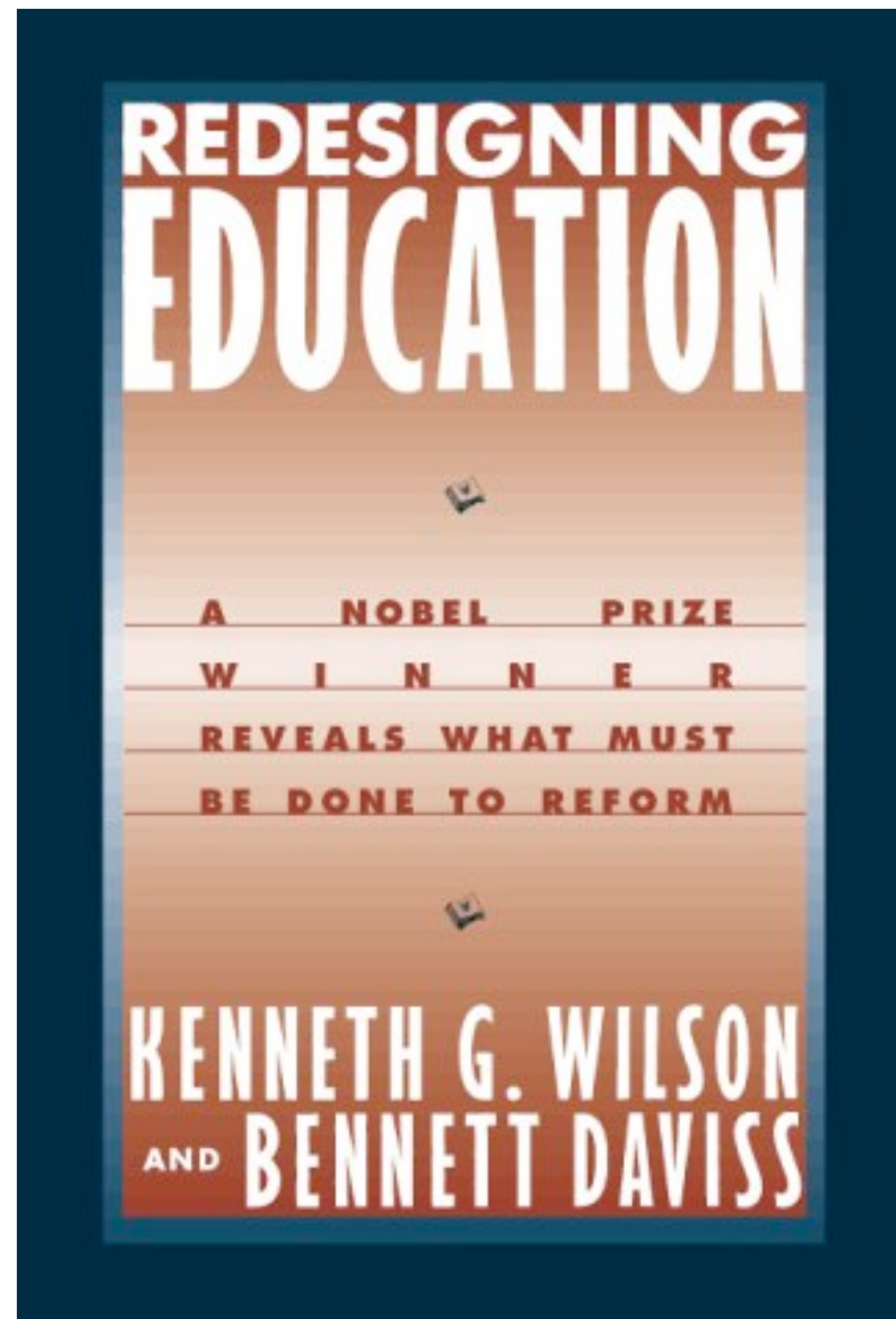
Lattice Conferences

1986, 1989, 2004

- 1986 (BNL): doubts about the timescale of lattice QCD.
- 1989 (Capri): *ab initio* quantum chemistry.
- 2004 (Fermilab): congratulations to the community for its success.

Science Education

1988–



Reminiscences

- “Tell me about the harmonic oscillator.”
- Critical phenomena course, Autumn 1982.
- Hadron spectrum phone call, November 2008.



photo by M. Shifman, at Gell-Mann's 80th birthday





Kenneth G. Wilson Award for Excellence in Lattice Field Theory

For significant contributions to our understanding of baryons using lattice QCD and effective field theory,



Kenneth G. Wilson Award for Excellence in Lattice Field Theory

For significant contributions to our understanding of baryons using lattice QCD and effective field theory,

to André Walker-Loud

