

Joel Scherk: 27 May 1946- 16 May 1980

8,349 SPIRES citations, 158 per paper

Thesis: 1971, Paris XI, Orsay
"Unitarisation et renormalisation dans le modèle
des resonances"

Panel: Ph Meyer, C Bouchiat, R Omnes, D Am-
ati and B Sakita

Princeton 1969-70

Berkeley Summer 1970

CERN 1971-73

NYU 1973-74

Cal Tech 1974-75

DAMTP Cambridge Spring 1977
Otherwise LPTENS

My first meeting: Tel Aviv April 1971: Duality and Symmetry in Hadron Physics. He spoke about his "zero slope limit" with unit intercept and hence massless particles with spin 1.

Then: CERN theory division September/October 1971. Haven for "dual resonance model string theory" created by **Daniele Amati** amidst a hostile world.

included

Daniele Amati, Claud Lovelace, Murray Gell-Mann (1971-72), Joel Scherk (1971-73), Lars Brink (1971-73), Peter Goddard (1970-1972), Paul Frampton (1970-72), Holger Nielsen ?, Jeffrey Goldstone ?, Charles Thorne ?, + visitors: Richard Brower, Sergio Fubini, Pierre Ramond, John Schwarz, David Gross, Werner Nahm, Jean-Loup Gervais, David Fairlie, Ed Corrigan + others.

+ Eugene Cremmer, Paolo di Vecchia

1971: Exciting time for subject

Big questions

No Ghost theorem?

Dual fermion model?

ie Is it a fundamental theory that is not a quantum field theory? ie does it satisfy general principles?

State of Play

Vertex Operators and propagators for tree diagrams

Virasoro algebra and gauge conditions

$$[L_m, L_n] = (m - n)L_{m+n} + \frac{1}{2}m(m^2 - 1)\delta_{m+n,0}$$

Concept of Physical State

$$L_m|\text{phys}\rangle = 0 \quad m \geq 1$$

Maybe satisfy No Ghost Theorem

$$\langle \text{phys}|\text{phys}\rangle \geq 0$$

Examples were DDF states

Lovelace: Twisted loop amplitudes possess

awkward branch cuts unless

Space-time dimension is 26

Effective space-time dimension is 24

and get poles consistent with propagation of states of closed strings.

ARRIVAL IN CERN 1971
 JOEL DID LARS BRILIK

I LOOKED AT DUAL FERMIONS OF PIERRE RAMOND

"SQUARE ROOT OF VIRASORO"
 $\sqrt{L_m}$

RAMOND
 MESONS
 FERMION \rightarrow

NEVER-SCHWARZ

$\neq 1$

ARE MESONS THE SAME?

THORN $\neq 1$
 CORRIGAN OLIVE $\neq 2$



SOLVE ALGEBRAIC EQUATION FOR V_F

$$V_F(x) V_F(y) = V_F(y) H(x)$$

NEVER-SCHWARZ FIELD

FOR A THEORY NEED



WITHOUT GHOSTS

USE BRINK OLIVE PROJECTOR ONTO PHYSICAL STATES SHOWN BY GODDARD + THORN TO BE DDF (TRANSVERSE) STATES IN $D=10$

USING BRINK OLIVE REBELI SCHERK'S OLIVE SCHERK'S

CORRIGAN GODDARD SMITH OLIVE'S PROVIDED ABOVE

BUT $m \neq m$ OPPOSITE G-PARITY

SCHERK: REMEDY BY PROJECTING OUT TACHYON

GAIN SPACE-TIME SUPERSYMMETRY

GLIOZZI OLIVE SCHERK 1977

CAP 23-27

DECLINE OF DUAL RESONANCE / STRIKING THEORY

DISCOVERY OF { ASYMPTOTIC FREEDOM
MONOPOLE SOLUTIONS
SUPERGRAVITY

77 DID LEFT CERN

CERN COLLABORATIONS BROKE UP

NO EUROPEAN NETWORKS

NO E-MAIL

80 JOEL DIED

ELEGANCE + SIMPLICITY

CONCERNING ENORMOUS

TECHNICAL POWER