

35 years @ SPhT
A few reminiscences

Jean-Bernard Zuber (LPTHE, Sorbonne Université)

Saclay, 9 November 2023

Reminiscences ...

1969-2004: 35 years @ SPhT

The 70's

1969 : SPhT had already moved to Orme des Merisiers (1968)

Sociology and demography of SPhT

less than 40 permanent physicists,
under the lead of Claude Bloch
and then Cirano De Dominicis



(pictures : courtesy of Georges Ripka)

age distribution: the most senior were ~ 40;
few permanent people (mostly CEA, a few CNRS), fewer stu-
dents (in 1969 3 new students D Lévy, A.Voros and I)

Science @ SPhT in 1969

3/4 themes (with blurred boundaries...)

– *nuclear physics and many body* : C. Bloch, V. Gillet, J. Raynal, M. Rho, G. Ripka, A. Lumbroso, B. Giraud, M. Chemtob, A. Jaffrin, R. Schaeffer, P. Bonche, a few students (B. Antoine, B. Gaffet...)



– *stat mech* : C. De Dominicis, J. des Cloizeaux, M. Gaudin, R. Balian, E. Brézin, J.-F. Renardy, A. Gervois



– *particles and fields* : R. Stora, M. Froissart, G. Cohen Tannoudji, A. Morel, H. Navelet ("CoMoNav"), C. Itzykson, D. Bessis, P. Moussa, J. Zinn-Justin, H. [Kluberg-]Stern, R. Peschanski, J-M Drouffe, D. Lévy, J.-B. Z.



– *math physics* : H. Cornille, M.L. Mehta, G. Mahoux, J. Bros, F. Pham, D. Iagolnitzer, A. Voros



Note : no postdoc, a few short term visitors
(Foreign) postdocs appeared at the end of the 70's, still no
French postdoc. . .

important technical staff :

- a team ("le pool") of 4/5 secretaries
Francine, Dany, Danièle, Eliane, . . .
–for typing articles–

+ Ms Jameux, secretary of the lab,

- Madeleine Porneuf documentalist + Monique Féron librarian

- "le bureau de calcul" (Nicole Tichit, Catherine Chevereau-[Bourgois], Clau-
dine Verneyre) + Mr Carré, for operation and maintenance of the IBM com-
puter



Computing @ SPhT

a few "desk calculators" + a big computer (IBM) operated with punched cards...



(no pocket computers : Hewlett-Packard, TI et al appeared in the mid 70's, no desk or portable computers: IBM "XT" and "AT" Personal Computers: '83-'84);

the art of programming and its geeks (M. Froissart, J-F Renardy, J-M Drouffe, J. Raynal, P. Bonche...)

Social life

- general seminar of SPhT, weekly, morally compulsory, (smoking permitted ... until end of 80's)
- five o'clock tea ...
- heated political discussions at coffee time (aftermath of the " '68 events"),...
- yearly "fête du Service", with sketches, practical jokes,... and dancing !



- [a sketch inspired by The Name of the Rose], [Marcel F and his tea cup trick]
[Cirano D D, André M., Robi P. and Claude I. best dancers]
- but also post-68 political tensions, budget and position cuts...

Practical life :

- computing
- **communication**:
 - *ordinary mail* (≥ 10 days for a return mail to the US); e-mail appeared in the mid 80's (my first use of bitnet in 1986);
 - *telephone* ... expensive and not of easy access in the early 70's
 - *typing* of administrative and scientific papers carried out by professional secretaries (electronic word processing appeared in the early 80's, Mathor \rightarrow TeX, my first TeX papers in 1988)
 - *preprints* sent ("orange cover") and received by ordinary mail (arXiv born in 1991); displayed weekly on shelves in the seminar/coffee room; also sent person-to-person : the importance of "mailing lists" ...
- **teaching**: few PhD students (Transition from "Thèse d'État" to modern format); little teaching at (under)graduate level.
- **financing research**: funding provided by the CEA (the lab was regarded by others as well endowed...); no contracts (ANR, ERC...). Less paperwork, less money, but more time to work!

¿ pros and cons ?

...

In the 90's : start of European networks

- **missions and travels**: more expensive but much easier !... ¿ ?

Science @ SPhT

Highlights in the 70's–90's

70's : rebirth of quantum field theory

RG and critical phenomena

Gauge theories and the Standard model, theory \leftrightarrow experiment

Non perturbative effects, solitons, instantons, SUSY...

Lattice gauge theories

Random matrices, large N limit etc

disordered systems, spin glasses, random field...

but no astrophysics and cosmology

no biophysics...

Science @ SPhT

Highlights in the 70's–90's

70's : rebirth of quantum field theory

RG and critical phenomena

Gauge theories and the Standard model, theory \leftrightarrow experiment

SUSY

Lattice gauge theories

Random matrices, large N limit etc

disordered systems

but no astrophysics and cosmology

no biophysics...

80's: – String theory and CFT's, quantum gravity. . .

but also, QHE, high T_c supracond., fullerenes, quasicrystals, biophysics in all its avatars, disordered systems, dynamical systems, etc

Science @ SPhT

Highlights in the 70's–90's

70's : rebirth of quantum field theory

RG and critical phenomena

Gauge theories and the Standard model, theory \leftrightarrow experiment

SUSY

Lattice gauge theories

Random matrices, large N limit etc

disordered systems

but no astrophysics and cosmology

no biophysics...

80's: – String theory and CFT's, quantum gravity. . .

but also, QHE, high T_c supracond., quasicrystals, biophysics in all its avatars, disordered systems, dynamical systems, etc etc

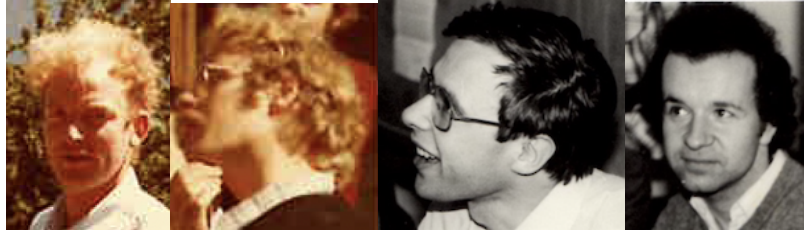
90's integrable models and their mathematical aspects

but also, cold atoms, quantum chaos, out-of-equilibrium physics, the birth of quantitative cosmology (COBE. . .), etc

Regular growth of SPhT in the 70's-80'

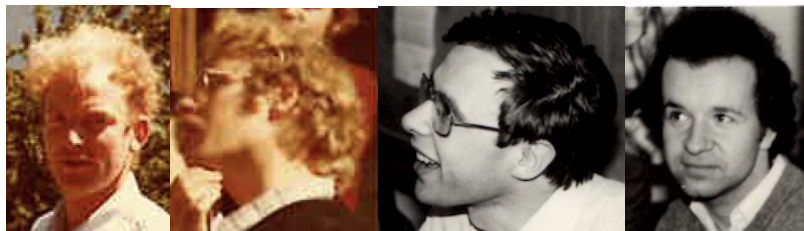
New blood in the late 70's, early 80's

Bertrand Duplantier, François David, Vincent Pasquier, Jean-Marc Luck



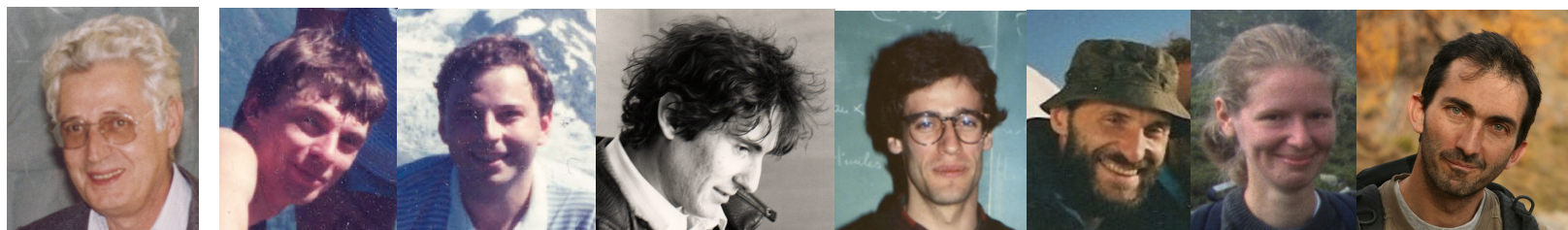
New blood in the late 70's, early 80's

Bertrand Duplantier, François David, Vincent Pasquier, Jean-Marc Luck



Mid 80's- mid 90's: a flock of bright young people, joining us in the study of CFT and integrable models.

Hubert Saleur, Philippe Di Francesco, Michel Bauer, Denis Bernard, Ivan Kostov, Didina Serban, Bertrand Eynard



'85–'95: A big flow of postdocs and students. A very exciting period, an outstanding decade...

My own thematic evolution: a drift towards mathematical physics:

- from particle physics [scattering of pseudoscalar mesons using a Yang-Mills phenomenological Lagrangian with D. Iagolnitzer and JZJ]

- to QFT

[perturbative: BRST renormalization of gauge theories with H. Kluberg-Stern; BPHZ renormalization with M. Bergère;

or non perturbative, large orders of P.T.; matrix theories];

the QFT book with Claude Itzykson

- to lattice theories [JMD-CI, JML...]

- to anomalies to CFT [...]

- to integrable theories and math physics

- to combinatorics and representation theory...

My own thematic evolution: a drift towards mathematical physics:

- from particle physics [scattering of pseudoscalar mesons using a Yang-Mills phenomenological Lagrangian with D. Iagolnitzer and JZJ]

- to QFT

[perturbative: BRST renormalization of gauge theories with H. Kluberg-Stern; BPHZ renormalization with M. Bergère;

or non perturbative, large orders of P.T.; matrix theories];

the QFT book with Claude Itzykson

- to lattice theories [JMD-CI, JML...]

- to anomalies to CFT [...]

- to integrable theories and math physics

- to combinatorics and representation theory...

Symmetry and group theory as a common thread

My own thematic evolution: a drift towards mathematical physics:

- from particle physics [scattering of pseudoscalar mesons using a Yang-Mills phenomenological Lagrangian with D. Iagolnitzer and JZJ]

- to QFT

[perturbative: BRST renormalization of gauge theories with H. Kluberg-Stern; BPHZ renormalization with M. Bergère;

or non perturbative, large orders of P.T.; matrix theories];

the QFT book with Claude Itzykson

- to lattice theories [JMD-CI, JML...]

- to anomalies to CFT [...]

- to integrable theories and math physics

- to combinatorics and representation theory...

Symmetry and group theory as a common thread

Random matrices as an obsession ? [1978, 1980, 1984-85, 1990, 1992, 2000, 2003, 2007, 2008, 2010, 2017, 2018-2020]

My own experience

In retrospect, luck +++++

the right lab ... (congenial atmosphere, pluridisciplinarity,...)

at the right time ... (exciting times, advances, pluridisciplinarity,...)

in the right field (Y-M field !)

and with the right people

My advisor Jean Z-J and my mentor Claude I

also R. Stora and M. Froissart (who both left in the early 70's)

and many others (Hannah Kluberg-Stern, Michel Bergère, and

later E. Brézin, R. Balian, G. Parisi; J.-M. Drouffe, J.-M. Luck ...)

and then my "young colleagues"...

Gratitude to this exceptional lab and the wonderful people that I met there ...

Thanks to them

My own experience

In retrospect, luck +++++

the right lab ... (congenial atmosphere, pluridisciplinarity,...)

at the right time ... (exciting times, advances, pluridisciplinarity,...)

in the right field (Y-M field !)

and with the right people

My advisor Jean Z-J and my mentor Claude I

also R. Stora and M. Froissart (who both left in the early 70's)

and many others (Hannah Kluberg-Stern, Michel Bergère, and

later E. Brézin, R. Balian, G. Parisi; J.-M. Drouffe, J.-M. Luck ...)

and then my "young colleagues"...

Gratitude to this exceptional lab and the wonderful people that
I met there ...

Thanks to them

and Thanks to you for listening !!