

## 50 Years of Communications in Mathematical Physics !

by ARTHUR JAFFE (Harvard)



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This summer marks a milestone in the history of our subject: the first issue of Communications in Mathematical Physics appeared just fifty years ago! This remarkable initiative originated with a small group of researchers who sorely felt the need for a journal that specialized in mathematical physics. Thinking back it is hard to imagine how our subject would have evolved so coherently without this top-quality, high-profile journal.

A key person in the founding of CMP was Res Jost in Zürich. He believed in the need for a journal in which physics and mathematics were both central. Jost was a friend of Konrad Springer, heir to the family dynasty that became famous for publishing outstanding scientific books and journals. In those times, personal connections and a close camaraderie led to many good developments. Res Jost, Jr. described to me how Konrad Springer met his father in the Josts' new home in Unterengstringen (a Zürich suburb) to discuss the possibilities for a new journal. One can imagine that Hilde Jost served them her wonderful Wiener Schnitzel! Through Jost and Springer the dream became reality.



*Res Jost*



*Klaus Hepp and Rudolf Haag in Zürich, 2004*

The algebraic quantum physics school with Rudolf Haag, Daniel Kastler, Nico Hugenholtz, and Huzihiro Araki was extremely active in discussing the need for such a journal. Everything about CMP in the early days could be thought to be in analogy with building a family—based on lots of love for mathematical physics as well as close personal ties among the principals. Res Jost asked Rudolf Haag to join him, and he was delighted. Sometime before the journal appeared, Jost decided that he could not be heavily involved, as there were other demands on his time. But he was sure that with Haag as Chief Editor the journal would be a success. And he was right!

Haag built the initial editorial board from his friends: Nico Hugenholtz, David Ruelle, Laurent Schwartz, and Abe Taub. They not only covered a wide spectrum of mathematics and physics, but they also brought prominence to the journal from the start. And what does one find on page one, of issue one, of volume one? It is a paper by Sergio Doplicher about “An Algebraic Spectral Condition.” This short work (begun while Sergio was a student visiting I.H.E.S) is still relevant fifty years hence.



*First Author: Sergio Doplicher  
(in Siena, after 36 years)*

Rudolf Haag described that his first job was to see that there was enough outstanding material to publish; quickly there was too much! I first learned about CMP during the visit of Rudolf Haag to Arthur Wightman during 1964, when I was a student at Princeton. Haag spoke about the plans for the journal, and advocates spread the word enthusiastically throughout the town. As a result, I submitted a paper on estimating the divergence of perturbation theory, and was overjoyed that it appeared in the second issue!

As with most new things, the start of CMP was very special. The mathematical-physics community was small, and almost everyone (at least in Western countries) knew

each other. Life was very informal compared with today. David Ruelle described the situation for the journal: “There was little bureaucracy, one did not have to have referees. If I liked a paper, then I wrote to tell the author. If I did not like a paper, I quoted a sentence or two nominally written by a ‘referee’.” This method worked, and the journal flourished without complication.

Many outstanding papers came to CMP. Of course in the early years there was a major representation of works on algebraic quantum theory. In a different area, the groundbreaking paper by Ruelle and Takens on turbulence and strange attractors also appeared in CMP. Today it is hard to believe that Ruelle-Takens work had been rejected elsewhere. Luckily Ruelle was an (original) editor of CMP and accepted the paper himself. He described this in his book *Chance and Chaos*, along with some interesting reflections on how journals function, and why it is not always easy to publish exceptional work.

Other work was never submitted, as I know from personal experience. One of my best papers proved stability for the renormalized, quartic interaction (in a finite volume of three-dimensional space-time). It took several years to obtain this result, jointly with Glimm. We introduced a new method (*phase-cell localization*) to study successive localization scales. After giving a seminar on this work in Princeton, I explored with Arthur Wightman, who was a CMP editor, the possibility to submit the paper to him. As interesting as the results were, Arthur thought that our paper as envisioned would be too long and technical for CMP. So not wanting to cause a problem, when the paper was finished we sent it elsewhere.

## Continuity

Over its fifty years, only six chief editors have been responsible for CMP. After Haag steered the journal for its first eight years, it had been planned that Jost would be his successor. But Jost suffered a heart attack in 1972, making it impossible for him to take over. Klaus Hepp stepped into the gap and Jim Glimm followed, each for about three years. My term lasted almost twenty one years. Then Michael Aizenman served for twelve years, and presently the chief editor is Horng-Tzer Yau.

In parallel to the editorial board, the responsible person at Springer Verlag is called the managing editor. Originally that was Konrad Springer, but as the journal developed it became the responsibility of Hermann Meyer-Kaupp. For a long period, CMP preserved its pioneering quality, but Meyer-Kaupp seemed to worry in the early 1970’s that the focus of the journal might be too narrow.

Luckily Wolf Beiglböck, himself a mathematical physicist at the University of Heidelberg, took over as managing editor about that time. Little is known to persons outside the publishing company about the impact that the managing editor can have on a journal. So I want to emphasize that our community owes an enormous debt to Wolf Beiglböck for the positive role that he played ‘behind the scenes’ at CMP. From the beginning of his time as managing editor, until his retirement, Beiglböck acted as a champion for CMP within Springer-Verlag.

One thing that I know he did, year after year, was to negotiate to keep the price per page of the CMP low in comparison to other Springer-Verlag journals. And an important

breakthrough was to convince Springer-Verlag to have a contract with IAMP allowing them to sell very highly discounted subscriptions through the IAMP for the personal use of members. Before the advent of the internet library, these private subscriptions became popular and provided a real convenience to the community, as well as loyalty to the journal. After Wolf retired, the journal passed to Liesbeth Mol, and presently it is managed by her successor Aldo Rampioni. Both of them have continued the policies to make the journal widely available, now also for electronic subscribers.

### **My Personal Involvement**

For the remainder of this essay, I shall discuss my personal involvement with the journal. I joined the editorial board in 1976, but when Wolf Beiglböck asked me in 1977 to take over as chief editor, it seemed daunting. Nevertheless I wanted to attempt to do what I could to help the community.



*Jim Glimm and Arthur Jaffe in Cargèse, 1979*

I travelled in Europe that winter and visited Rudolf Haag at DESY in Hamburg. We discussed the journal extensively, and how he might envision its future. While Haag remained an editor of the journal, he had not been chief editor for six years. Yet he was

key to consult, as I wanted to ensure that the traditions of the journal would continue. As a friend of Hepp and of Glimm, of course I spoke with them as well.

I also went to Heidelberg to see Springer-Verlag, where Wolf Beiglböck was a generous host. We discussed the fact that I wanted to attempt to broaden the scope of the journal, both in the direction of physics and also of mathematics. While in Heidelberg I also met the production manager Walter Doll, who was so important to producing a beautiful looking journal with an impeccable quality of typesetting. The emphasis and love for quality came not only from the editorial board, but also from the publisher who had many loyal adherents.

### **Initial Moves**

At Harvard we had a successful seminar that involved both researchers from mathematics as well as from physics. This reached across the boundaries between the subjects, and centered on mathematical physics. I had the goal to attempt to bring this spirit into CMP.

In order to broaden the reach of CMP, I decided at the beginning to add five new editors, and to reorganize the advisory board as an attempt at outreach. In that spirit, I suggested Édouard Brézin, Konrad Osterwalder, Barry Simon, and Yasha Sinai as editors, and that David Ruelle rejoin the board. I asked Michael Atiyah, Gerard 't Hooft, and C.N. Yang to become advisors. Soon afterward, I added Stephen Hawking and Shing-Tung Yau as advisors, both of whom became editors about one year later. And shortly Alain Connes, Michael Herman, Jürg Fröhlich, Tom Spencer, and others joined the editorial board.

As a second initiative I encouraged the editors to be active in soliciting papers. I did this myself, but once got into trouble. For in CMP it is important to be clear about “what you know” vs. “what you think you know.” The referee of a paper that I solicited from a physicist, pointed out a mathematical problem. The beautiful picture in the paper depended on an unproved existence theorem for a certain linear PDE. Of course everyone believed that PDE had a solution. And once the specific question had been clarified, the existence proof appeared rapidly in a paper by a mathematician. The problem was to convince the reluctant physicist author to change his paper to state that the question was actually open. In the end, luckily that was not so difficult.

### **Editorial Meeting**

The first issue published during my term as chief editor appeared on my birthday, December 22, 1978. Not long afterward, I organized my first meeting of the editorial board during the 1981 IAMP Congress in Berlin. We had a very pleasant dinner in a park restaurant where we also discussed the present and the future of the journal.



*Dinner meeting August 13, 1981 in Berlin at the "Chalet Suisse, das Restaurant im Grünen": Werner Ehlers, Joel Lebowitz, Jürg Fröhlich (partially hidden), Misha Polivanov, Elliott Lieb, Jim Glimm, Kurt Symanzik, Jean Ginibre, Huzihiro Araki, Tom Spencer, Arthur Wightman, and Yasha Sinai. Rudolf Haag and Konrad Osterwalder were there, but they do not appear in the photo! I took the picture.*

There was discussion about "What is mathematical physics?" and "What are the standards for CMP?" I had the view that it was unnecessary for all CMP articles to prove theorems. I would be happy if an important new idea in physics first appeared in CMP. However, every paper in CMP should be precise about stating whether its contents were theorems or conjectures.

## Haag Celebration

One of the first things I did as chief editor, was to suggest to Wolf Beiglböck that we invite Res Jost to edit a special issue of CMP dedicated to the 60th birthday of Rudolf Haag. This appeared as Volume 85, Number 1, and was published on August 17, 1982. Not long afterward, Rudolf visited Cambridge to give a seminar. We took this opportunity to hold a small dinner to commemorate the occasion with friends of Rudolf in the private dining room of the Harvest Restaurant (owned at the time by architect Ben Thompson, who designed the building). On that historic occasion, I presented to Rudolf a leather-bound copy of the special issue.



*Dinner in 1982 at the Harvest Restaurant in Cambridge, Massachusetts to celebrate Rudolf Haag and CMP: Joan Glashow, Barbara Haag, Rudolf Haag, Sheldon Glashow, Arthur Jaffe, Barbara Drauschke, Raoul Bott, Phillis Bott, Klaus Hepp, Konrad Osterwalder, and Walter Kaufmann-Bühler (who served as the scientific liaison in the New York office of Springer-Verlag).*

Shortly afterward I wrote a letter to Konrad Springer starting, "On September 27, 1982 we had a small dinner in Cambridge, Massachusetts to celebrate Rudolf Haag's 60th birthday and to officially present him with Volume 85, Issue 1 of CMP." This letter also gave an opportunity to reaffirm to the publisher that CMP was regarded in the

community not only as a leading journal in mathematical physics, but also in physics and in mathematics.

October 14, 1982

Dr. K. Springer  
Springer-Verlag  
Zeitschriftenabteilung I  
Postfach 105 280  
D-6900 Heidelberg  
Federal Republic of Germany

Dear Dr. Springer,

On September 27, 1982, we had a small dinner in Cambridge, Massachusetts to celebrate Rudolf Haag's sixtieth birthday and to officially present him with Volume 35, Issue 1 of *Communications in Mathematical Physics*. This issue was dedicated to him on his birthday in recognition of his position as the first chief editor and as one of the founders of the journal. I put together the special issue in collaboration with Res Jost, the other moving force in establishing CMP.

Three of the four chief editors of the journal attended this dinner, as recorded in the enclosed photograph. I thought you might also be happy to know that *Communications in Mathematical Physics* is now regarded as the very best journal in its area, as well as one of the most important journals both in the mathematics world at large and in physics at large as well.

Yours sincerely,

Arthur Jaffe  
Chief Editor

Enclosure

P.S.-Photograph from left to right: Mrs. Glashow, Mrs. Haag, Rudolf Haag, Sheldon Glashow, Arthur Jaffe, Barbara Drauschke (editorial assistant for *Communications in Mathematical Physics*), Raoul Bott, Mrs. Bott, Klaus Hepp, Konrad Osterwalder, Walter Kaufmann-Bühler (Springer-Verlag).

cc: Professor W. Beiglböck  
Mr. W. Doll  
Mr. W. Kaufmann-Bühler

*Letter to Konrad Springer, October 1982*

We had many other editorial meetings. I recall them during IAMP meetings in London (at the Oxford and Cambridge University Club), in Marseilles (at a nearby restaurant), and in Paris. We had a meeting in Princeton (at the Institute for Advanced Study), and other places. We took advantage of summer schools with several editors attending. For example there was a meeting in Les Houches and a wonderful dinner in a Corsican restaurant near Cargèse, during a long Corsican summer school.



*CMP Editorial Dinner near Cargèse, Corsica during a Summer School in 1987 Back Row: Raymond Stora, Krzysztof Gawędzki, Luis Alvarez Gaumé, Gerhard Mack Middle Row: Jürg Fröhlich, Gerard 't Hooft Front Row: Arthur Jaffe, Giorgio Parisi, Alain Connes, Konrad Osterwalder*

### What Does the Chief Editor Do?

The Chief Editor is responsible for the scientific quality of the journal. This has to be the number one focus, first and foremost.

The appointment of editors and advisors is crucial. These are the persons who shape the policies of the journal, and who shape the perception of the journal by the community. In CMP the editors have a great deal of freedom, so the editors need to commit to CMP being a flagship journal.

Generally I only appointed an editor who already published in the journal. Even though I knew personally most of the potential editors, nevertheless I tried to sit together with each new editor—either to discuss the philosophy of the journal, or to emphasize

how I hoped their participation would benefit the community. During my term as chief editor, I believe that I appointed almost thirty persons as editor or advisor.

A second job of the chief editor was to read many papers and to correspond with many persons: authors, referees, and editors—as well as the publisher. Many papers were sent directly to me at Harvard, and I received one almost every other day. I handled quite a few papers myself, including most papers written by other editors. So I ended up reading those papers, and in many cases sending them to a referee. But I also transferred a large number of the submissions to other editors. Occasionally the correspondence was not pleasant, as when I needed to mediate a disagreement between an author and an editor. But I always tried to be firm, and helpful.

And also one needs to manage the day-to-day flow of work (including developing the computer software at the start), to organize meetings of the editorial board, and to oversee the interface between my assistant, Barbara, and the publisher. This centered about Barbara's small office in Jefferson Laboratory.

## **My Assistant**

One thing struck me when I was asked to be Chief Editor. I was sure that I needed the assistance of Barbara Drauschke, who had worked for me in the past, but who had left to raise her family. So I contacted Barbara and explained that I thought it would be impossible to make things work without her help. Luckily she came back as I requested and has worked with me ever since.

I need to tell one story about my experience with Barbara, who originally intended to teach school. But when those plans did not pan out, a friend brought her to Harvard and by luck she was assigned to work with me. What a boon for Harvard and later for CMP!

Barbara has an excellent memory for names and for people, so she soon got to be known by editors, authors, and referees alike. One of the jobs that Barbara had was to prepare all the accepted CMP manuscripts for typesetting, before they were mailed to Springer-Verlag in Germany. This job included reading each paper for its style of writing, as well as to correct issues of formatting. Although Barbara had studied neither mathematics nor physics, she used her intelligence adeptly. She could intuit when an author needed help.

As a result Barbara had a lively correspondence with many authors. She often received letters thanking her for improving the wording in their papers, or for suggesting other improvements. But after some time, a letter arrived from an embarrassed author, addressed to “Dr. Barbara Drauschke,” thanking her for finding a crucial mathematical gap in the text. It turns out that when one has a gap in mathematical thinking, it often goes with a gap in writing—and in this case it had eluded the referee as well as the author! So perhaps it came as no surprise when one day a letter arrived from another author with thanks, and it was addressed to “Professor Barbara Drauschke”!

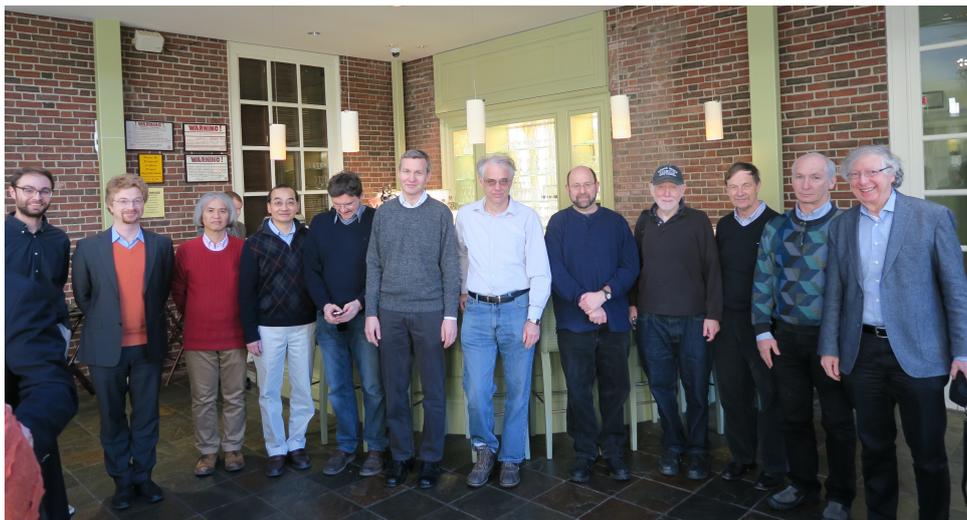
## Computer Log

The other missing administrative tool concerned how to keep records. Up until then all the records were kept in the chief-editor's log book. I decided that it was getting too complicated to keep track of the increasing number of manuscripts in that way, and wanted to keep the records electronically. But at the time there was no software suitable for doing this. So a graduate student of mine, Mario Inchiosia, and I decided to write software to do this. We were quite naïve, and had no idea how hard this would be, so the project dragged on for almost a year. But it resulted in a robust program that we used to manage the journal throughout my tenure, and which Barbara still uses to track names and addresses.

Electronic data keeping, made it easy to see if the same article had been sent to more than one editor. If one editor had rejected a paper, the author sometimes sent it to a different one. With the computer system, it was easy to see when this happened, and for the sake of courtesy, I always let the original editor know. Generally nobody minded, but one time I got into the middle of a terrible struggle between editors. Editor A said, "It is your choice, but if you *accept* this paper, I will resign from CMP." But Editor B said, "If you *do not accept* this paper, then I will resign from CMP." I actually do not remember the outcome; but in dealing with people you can sometimes reason.

## CMP Today

I have tried to survey the early history of CMP. Yet both CMP and Springer-Verlag have evolved. In January 2015, H.-T. Yau hosted the editors for a meeting in Cambridge, Massachusetts. Here is the group that attended lunch. That much is the same.



*Editorial Meeting in Cambridge, Massachusetts, January 23, 2015: Alex Gontar, Nikita Nekrasov, Yasu Kawahigashi, Horng-Tzer Yau, Pjotr Chruściel, Manfred Salmhofer, Misha Lyubich, Steve Zelditch, Percy Deift, Herbert Spohn, Konstantin Khanin, and Arthur Jaffe*

The father of Konrad Springer, Ferdinand, cultivated his authors, including Max Born, Richard Courant, David Hilbert, and John von Neumann. Mathematical physics meant something special to him, and he also founded the famous “yellow series” of mathematics texts. He established regular social engagement between authors, editors, and the publisher, and this became the norm at Springer-Verlag. I experienced and also valued this tradition. Meanwhile the company grew into one of the largest academic publishers.

In 1999, Springer-Verlag changed in the same way that so many other organizations and institutions have changed. It went from being a family enterprise, with its primary vision focused on intellect, into a part of a giant corporation Bertelsmann, with its primary vision focused on business. Members of the top company management no longer went to dinner at the home of the scientist editors.

CMP has also evolved, and it is striking that it covers an every wider territory. The journal thrives today in this larger framework, yet CMP still attempts to maintain its “family” outlook. The internet and the arXiv have changed publishing tremendously over the past thirty years. And it is difficult to predict how the world of publishing will evolve in the future. Whatever happens, I hope that our community will preserve the aura of wonderful excitement from the constant discovery of new mathematical physics, along with the high intellectual standards now reflected by CMP.

### **Thanks**

I am grateful to friends and colleagues for interchanges that helped me enormously in writing this essay. I especially thank Wolf Beiglböck, Barbara Drauschke, Jürg Fröhlich, Jim Glimm, Rudolf Haag, Klaus Hepp, Nico Hugenholtz, Res Jost, Jr., Konrad Osterwalder, Aldo Rampioni, David Ruelle, Manfred Salmhofer, and Valentin Zagrebnov.