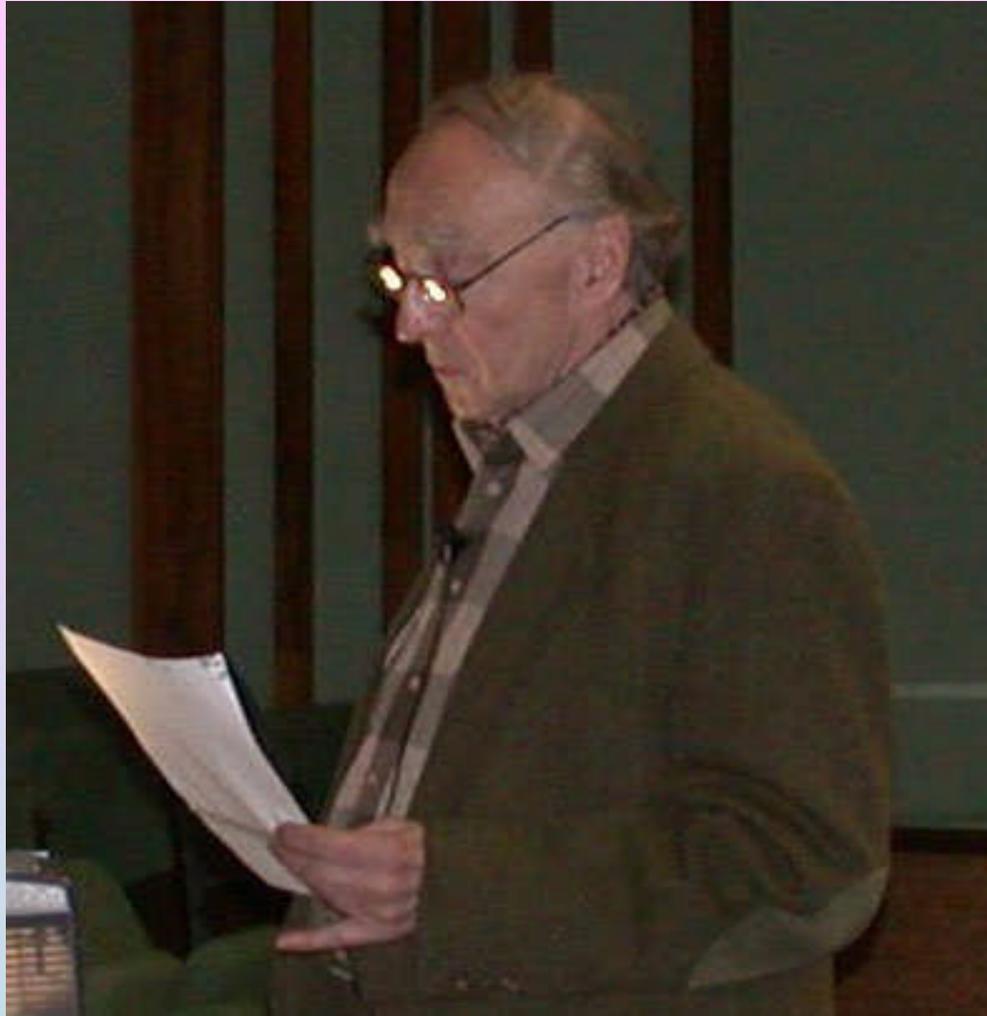


## Richard Geller Prize



A part of my story with Richard Geller, such an influence on my professional life !

When I met Geller I was a baby...



## Half of the truth...

I was a 21 years old Master student in Plasma Physics in Grenoble fascinated by **excellent Geller lectures** like other students

To obtain the Master diploma a one month work experience was required  
I thought 'it's not enough'

I negociated and obtained a 6 month work experience at University  
University political corridor fights (after 3 months I had to stop my work experience)

So I was looking for another work experience for my master

I went to Geller office (**SOS !**)

**'You should not go in plasma Physics, its really hard, you will regret !'**

I was obtuse, I wanted to go on, I told him I wanted to perform an experimental  
AND theoretical PhD in plasma physics and ion sources

So I began to study ECR Ion Sources

**Geller was right for the middle part of the sentence!**

## Two subjects

SmCo5 hexapole design with R. Pauthenet (increase from 0.42 T to 0.8 T)

ECR stochastic heating with R. Nakach

## Frustration !

All my work concerning hexapole design was published by R. Pauthenet

### JOURNAL DE PHYSIQUE

Colloque C1, supplément au no 1, Tome 45, janvier 1984 page C1-285

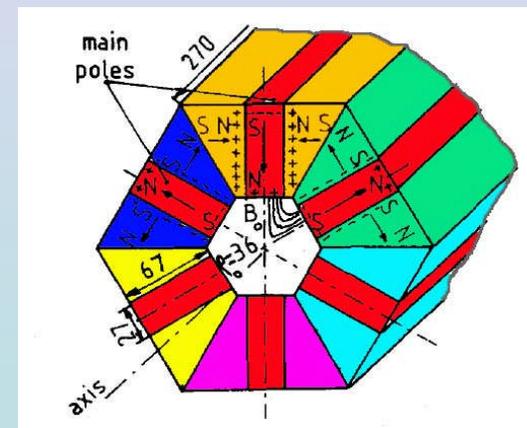
NEW PERMANENT MAGNET DEVICES

R. Pauthenet

Service National des Champs Intenses, C.N.R.S., 25, Avenue des Martyrs,  
166 X, 38042 Grenoble Cedex, France

The field configuration is also equivalent to that produced by a distribution of magnetic masses with density  $\sigma = \vec{J} \cdot \vec{n}$ . The calculation of magnetic induction reduces to that of electrostatics. I use this representation to calculate the components  $B_x$ ,  $B_y$ ,  $B_z$  of the induction corresponding to a rectangular surface (Fig.2), of sides  $2a$  and  $2b$ , with magnetic masses  $+J$ . The rectangular frame of reference is at the center  $O$  of the rectangle. The  $Ox$  axis is parallel to the side  $2a$  and the  $Oy$  axis to the side  $2b$ ; the  $Oz$  axis is perpendicular to the plane.

$$B_x = \frac{\mu_0 J r}{4\pi} \cdot \text{Log} \left[ \frac{(y+b) + \sqrt{(x-a)^2 + (y+b)^2 + z^2}}{(y-b) + \sqrt{(x-a)^2 + (y-b)^2 + z^2}} \cdot \frac{(y-b) + \sqrt{(x+a)^2 + (y-b)^2 + z^2}}{(y+b) + \sqrt{(x+a)^2 + (y+b)^2 + z^2}} \right]$$
$$B_y = \frac{\mu_0 J r}{4\pi} \cdot \text{Log} \left[ \frac{(x+a) + \sqrt{(x+a)^2 + (y-b)^2 + z^2}}{(x-a) + \sqrt{(x-a)^2 + (y-b)^2 + z^2}} \cdot \frac{(x-a) + \sqrt{(x-a)^2 + (y+b)^2 + z^2}}{(x+a) + \sqrt{(x+a)^2 + (y+b)^2 + z^2}} \right]$$
$$B_z = \frac{\mu_0 J r}{4\pi} \left[ \text{Arc tg} \frac{(x+a)(y+b)}{z \sqrt{(x+a)^2 + (y+b)^2 + z^2}} + \text{Arc tg} \frac{(x-a)(y-b)}{z \sqrt{(x-a)^2 + (y-b)^2 + z^2}} \right. \\ \left. - \text{Arc tg} \frac{(x-a)(y+b)}{z \sqrt{(x-a)^2 + (y+b)^2 + z^2}} - \text{Arc tg} \frac{(x+a)(y-b)}{z \sqrt{(x+a)^2 + (y-b)^2 + z^2}} \right]$$



**Geller offered me the opportunity to give** my first talk (ECR Stochastic heating)

4th International Workshop on ECR ion sources, C.E.N. Grenoble, 1982

Geller, R., Jacquot, B. and Lamy, T.,

Rapport EURCEA-FC 1138

Experimental work

To establish the stochastic heating law  $E(e^-) = P_{HF}^{2/3}$

During the same time **B. Jacquot was developping the CAPRICE source**

(caprice /kapris/ masculine noun (of person) **whim**, faire un ~ **to throw a tantrum**)

**Geller did not believe so much in the CAPRICE source at the beginning**

I spent evenings looking at them fighting...

I'll allways remember Geller's sentence to Jacquot:

**Leave the young guy perform the experiments !**

After having written down my PhD, Geller told me it was excellent.

**He was always optimistic...!**

I finally decided to quit the ECR world (refusing to submit my PhD) and to study nuclear engineering.

4 years later **Geller asked P. Sortais to contact me** because there was a permanent position opened at CNRS to build LAGRIPPA facility (CAPRICE Source and 5 beam lines for atomic Physics)

**Geller was a generous man and really clever!**

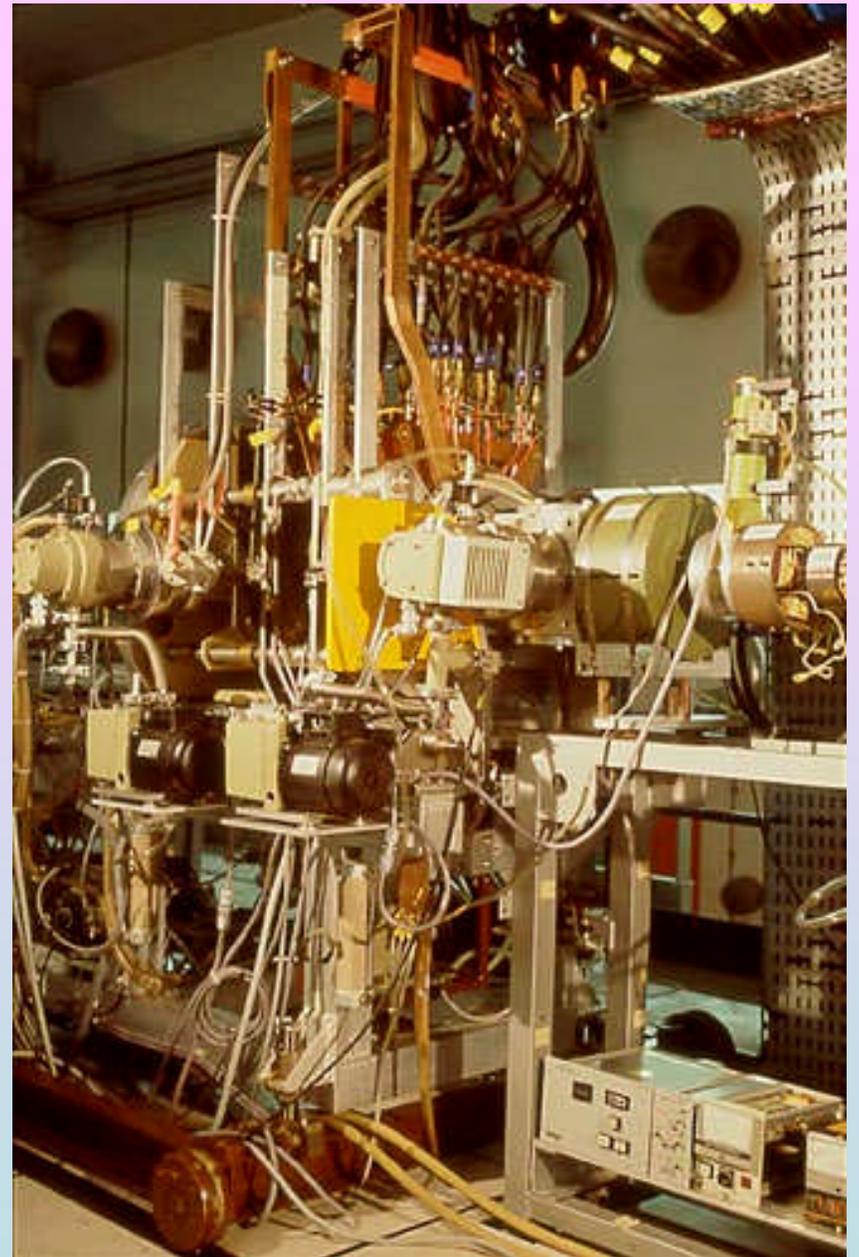
I decided to try for the last time...

**J. Andrae hired me, and I was back in the ECR world !**

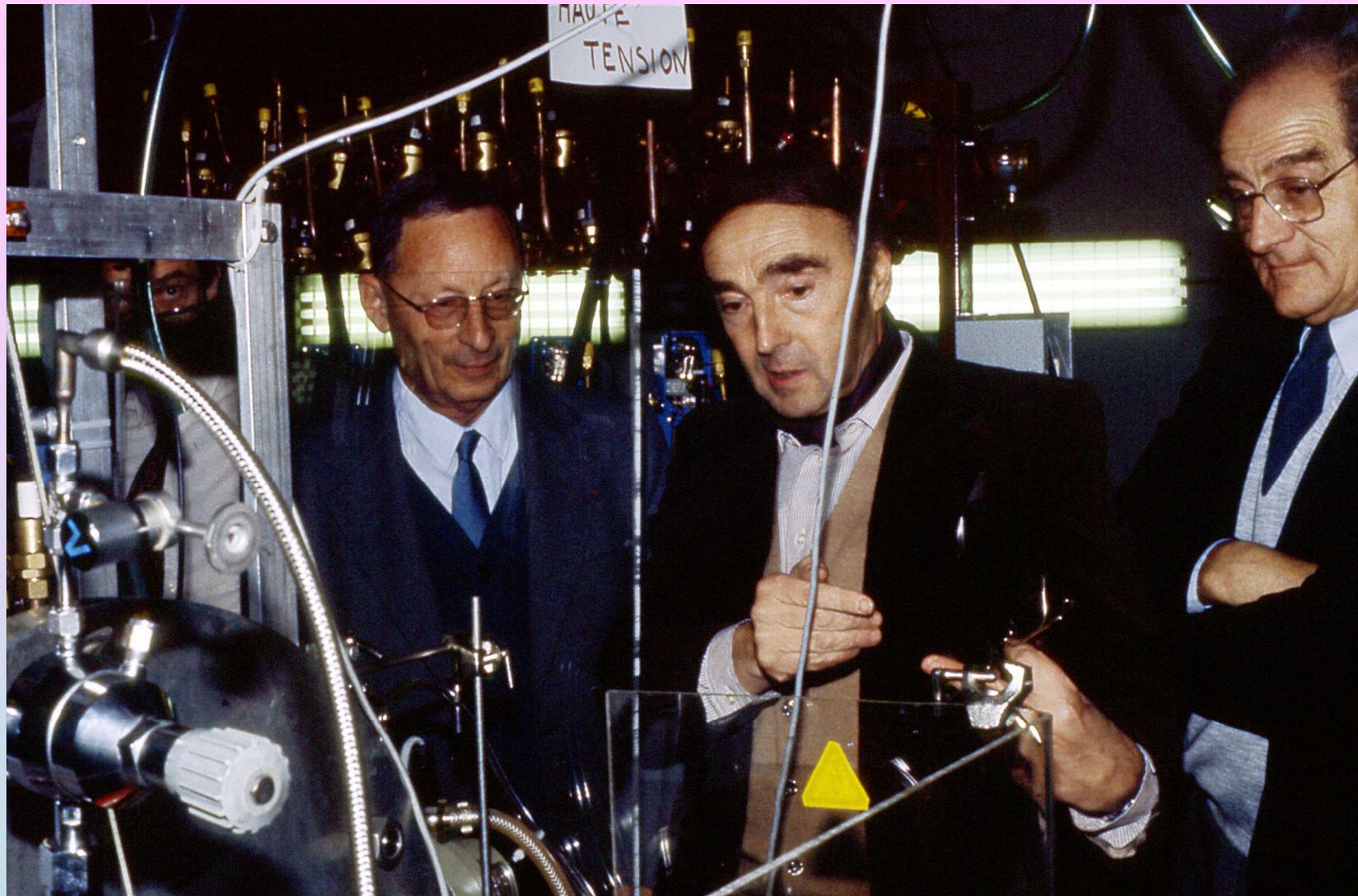
ECRIS MINIMAFIOS lent to ISN-Grenoble  
by Richard Geller 1983.

The same year Ganil was inaugurated

First accelerated heavy ion beams in France for  
nuclear Physics.



## First ECR source at ISN (1983)



I arrived at ISN (LPSC now) in 1996, I met Geller again, he was a scientific advisor.

### **He was the inventor of the ECR charge breeding**

I improved the technical environment and made the design of PHOENIX Booster with P. Sortais.

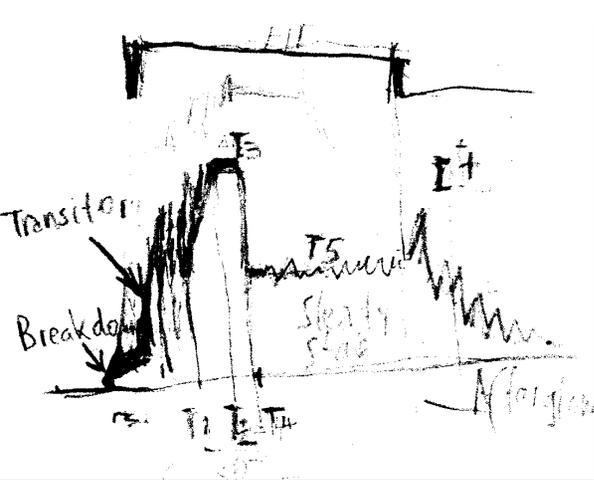
**I have really appreciated all the scientific discussions we had, Geller and I.** sometimes it was close to philosophy.

Sometimes we disagreed, but he was always attentive to my arguments. When he was invited and could not honor the invitations, he asked me to go.

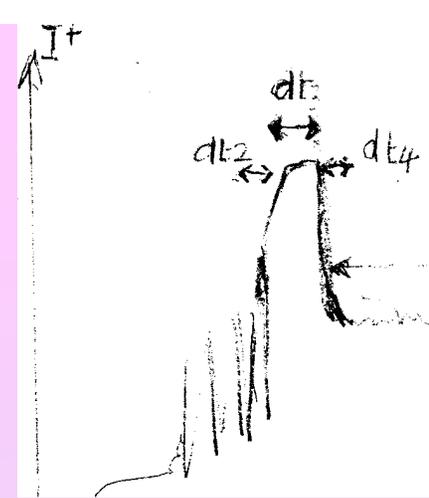
I accepted once, but refused after, because I did not think I could be as excellent as he was !

He worked a lot for the hadrontherapy ETOILE project in Lyon wich was finally accepted and will be soon built

The preglow was his last passion. He considered this process as really fundamental.



May be it will be published one day !



A clever man  
A generous man  
I miss him !