Cher Rémi, chere Arlette, Magnificencjo, Wysoki Senacie, Szanowni Państwo,

Thinking about this talk, I hesitated for a while what language should I use.
Francais? Trop difficile pour moi.
Polski? Zbyt trudny dla naszych francuskich gości nawet jeśli prof. Langevin rozumie to i owo.
So, English.
This choice is natural since these days English is the most universal language used by the international mathematical community and this is the language we, I mean professor Langevin and myself, were using in several countries (France, Poland, United States, Brazil, Japan and so on) in our collaboration. This was, say, honest: English is foreign for both of us, so our position with respect to the language in use was, speaking in geometric terms, symmetric.

I spent a good while talking about languages since mathematics is also a language: the language we use to describe certain properties of the world surrounding us. By most of the worldwide population, this language (as Polish for most foreigners) is recognized as very, very difficult. Moreover, in mathematics, one can find different „dialects": algebra, analysis, geometry and many others (today's American Mathematical Society subject classification distinguishes about 100 „dialects", that is principal topics in mathematics). In many cases, people speaking one of them (say, algebra) hardly understand people speaking another one (say, geometry). Professor Langevin speaks several of these „dialects" but that of geometry seems to be the closest to him.

Throughout the years, Professor Langevin was engaged in research on different subjects, the most important of them belonging to the area of integral geometry, conformal geometry and dynamical systems, classical and generalized such as foliations. In each of these areas, he obtained important results, but let me restrict my attention here to two of them which are the closest to me.

In late 80's (of last century, of course), Professor Langevin and his collaborators (Etienne Ghys, myself and the others) invented and studied the notion of entropy for foliations considered as generalized dynamical systems. Roughly speaking, classical dynamical systems can be considered as solutions of systems of ordinary differential equations while foliations can be seen as solutions of systems of partial differential equations, and the theories of classical dynamics and foliations can be seen as studies of qualitative properties of such systems. The notion of entropy appears in physics and mathematics as well, and in both fields it plays the role of a certain measure of chaotic behaviour of a system. In the research on entropy of foliations, several relations between different aspects (dynamical, topological and geometric) have been established. Let me quote explicitly just one of the results from this area:

Theorem. Entropy of a codimension-one foliation is positive if and only if the foliation contains a resilient leaf, while vanishing entropy of a foliation implies

vanishing of its Godbillon-Vey characteristic class.

I am not able to describe here all the notions involved in this theorem, let me just mention that the Godbillon-Vey class is an object belonging to algebraic topology, another “dialect”.

Since, approximately, the year of 2000, Professor Langevin put his attention on conformal geometry of surfaces and, again, foliations. In his research in this area, he uses Lorenz geometry, one of the main tools in the relativity theory in physics, which allows to produce, for example, a one-to-one correspondence between 2-dimensional spheres contained in the 3-dimensional Euclidean space and points of some very particular 4-dimensional subspace (called de Sitter space) of the 5-dimensional Lorenz space. For example, in this “dialect”, canal surfaces defined usually as envelopes of 1-parameter families of spheres, can be seen just as curves in the de Sitter space. Let me formulate now another result of our guest:

Theorem. There exist no foliations of compact 3-dimensional hyperbolic manifolds whose all the leaves are Dupin cyclides.

Again, since I am not able to explain all the notions used there, I want to say only that Dupin cyclides are canal surfaces of very special type: they appear as conformal images of tori, cylinders and cones of revolution and can be characterized by so called “spherical two piece property”: every sphere splits a surface of this type into at most two parts.

Let me mention, that conformal geometry has deep applications in computer graphics, a very, very important area of today's computer science. Other results of Professor Langevin, these belonging to classical dynamics, were applied in the study of sign languages (by Brazilian researchers studying such languages used by Amazonian Indians) .

Professor Langevin deals also with fine art (he paints beautiful pictures, see his self-portrait on the second page of his CV distributed here) which has also some influence on his research in mathematics: his geometric papers are equipped with extremely good pictures which help to understand better the sense of some arguments.

Due to his family relations, Professor Langevin was lucky to find in certain basement a manuscript of lectures on elementary physics, lectures given by Maria Skłodowska-Curie to a group of children of Sorbonne professors. Due to Professor Langevin efforts, the lectures were edited in a form of a book and the book was translated to Polish and published by Wydawnictwa Szkolne i Pedagogiczne.

Now, a bit less formally... Your, Rémi, first visits to Łódź took place in mid-80's when shops in Poland were empty, we used special coupons (called „kartki”) for food, almost no restaurants were available and so on. Dark days... One evening, we

went together to Teatr Wielki, one of few reasonable choices. After the performance,we tried to find a place for dinner. After several unsuccessful attempts in existing restaurants we ended up in my apartment where, together with my wife (pamiętasz, Zosiu?) and another friend, we produced a home made pizza. Years after, we told this story our colleague and friend from Chicago. He reacted asking „Home made? Why didn't you order pizza by phone?”. This proves (note that all the theorems in mathematics require proofs) that to understand themselves people need not only a common language like English, but also a bit of common experience. And this is the case of you, Rémi, and us, geometers from this university.

Feeling that you all are tired of both languages, English and mathematics, I was speaking all the time, I will complete this talk using, in a totally incompetent way, another language. Let me say:

Vivat Mathematica! Vivat Geometria! Vivat Rémi Langevin, Doctor Honoris Causa Universitatis Lodziensis!

Merci, thank you, dziękuję za uwagę.

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Quod felix faustum fortunatumque sit

HT = hoc tempore

die undevicesimo

anno bis millesimo duodecimo