

Some Times and Some Physics with Michal

In the late 1970's I became interested in energy deposition in high energy nuclear collisions, or, in modern terms, "Can one make a quark gluon plasma in ultra-relativistic nuclear collisions?" At that time, the information came from high energy proton nucleus collisions:

Theory:

Bialas and Czyz, Bjorken, based on picture due to Landau, Pomeranchuk and Migdal
Bialas and Czyz, Nuc. Phys. B11 (1976), 461-476

Experiment:

Busza's group
Phys. Rev. D27 (1983) 2580

The mystery was the dependence of multiplicity on nuclear size and the lack of intranuclear cascading.

Understanding this leads to a modern picture of ultra-relativistic heavy ion collisions.

Allows one to compute the energy deposited, and the time scales for the formation of high energy density matter.

The surprise was the energy densities were large enough and the time long enough to make a Quark Gluon Plasma.

In 1984, I met Bialas in Seattle, and visited the Krakow School in Zakopane
(I had met Bialas before in Germany, I think.)

This was a few years after Jaruzelski had installed a pro-Russian dictatorship.
I had previously met my good friends Ludwig Turko and Krzysztof Redlich in the early 1980's, and
Ludwig would be jailed and was being hounded by the political police.

Zakopane at that time was very quiet. The stores had few essential goods in them. But this was in
absolute contrast to the friendly and active atmosphere at the school. I met Michal for the first
time. He was full of energy and seemed to be able to make beer appear out of thin air, like a
magician. We were treated very well, and although resources were scarce, they were efficiently
used, and the dreadful political atmosphere was compensated by the comradery that developed
among senior and junior scientists and postdocs. It was the beginning of a strong lifetime
friendship with Michal, and Anzdrej Bialas, and as well Atsushi Nakamura, who I came to know as a
very sophisticated man with a deep appreciation of art, music and culture, and physics as well.

We climbed to the Giewont, and looked out over the broad foothills of the Tatra mountains. We
went to the cemetery with its heroes, writers, scientists and mountain climbers. We listened to a
joke by Anzdrej Bialas about a long forgotten rabbit who could not get along with the Russian
authorities, was vocal about his dislike, and was savagely beaten every day, but when asked why
he did so, his answer was:

“I am a rabbit. What else can I do?”

July 1984, 22nd Conference on High Energy Physics, Leipzig (at Karl Marx University)

I met Michal again in Leipzig. Michal had a wicked sense of humor about Russia and Communism. This was in contrast to the East Germans who made no jokes about the Russians. I was told the East Germans really wanted the system to work, and they were doing that was needed to have Communism succeed, whatever that means. I think the truth was different. They were afraid, with good reason.

Food was scarce at that time in East Germany. There was a huge opening reception at the meeting with a table full of fresh meats and fruits. But there was not enough. The table was rapidly mobbed, and there was a rumor of a man who would crawl on his knees to the table, reach up, grab a sandwich, and then disappear. But the East German physicists tried hard to make us comfortable.

My wife Alice and I went to the Ratskeller in Leipzig where Faust made his bargain with the devil. We ate with an old German couple who had come from many miles away so they could have an evening with foreigners.

Michal and I ate together at the banquet. Michal became friends with a special waiter. He was the waiter who carried out champagne. Michal somehow arranged it so that every time the waiter passed our table, we would get a new bottle of Sovetskoe Champanskoe. I think it was Michal's irresistible Polish charm. That evening we had much good conversation with many friends, new and old, and drank a little champaign too.

In 1988, I returned to the Krakow school when Gorbachev was in power in Russia, and the Berlin wall would fall a year later. The economy of Poland was better. Michal arranged evening get togethers with beer and many jokes were told.

Some favorites:

Andrzej Bialas explained how we could buy items like washing machines in Poland. Washing machines were very rare and very expensive. They could only be bought with foreign currency, but it was illegal to buy with foreign currency. You needed to advertise in the newspaper to buy a washing machine, and you could not mention foreign currency.

There was a very simple solution:

You write: “Person recently returned from abroad, wishes to buy washing machine...” if you have the foreign currency.

If you did not have quite enough foreign currency and wished to pay in partly with Zloty’s you could say,

“Person partially returned from abroad wishes to buy washing machine..”

Peter Arnold told us that when he was in Warsaw, he met a Pole who had recently been to Russia. The Pole was very tired from hauling a very heavy suitcase from the train. He was excited and showed Peter his fantastic new watch he just bought in Russia. A very nice electronic watch, gold plated and waterproof. He was very happy with the new Russian technology, then pointed at his suitcase and said,

“But the batteries are quite heavy”.

Michal arranged it so that I returned to Warsaw by a night train.

Everyone was drinking and no one wanted to vote, but they were required to return home and do so. There were flyers everywhere, with pictures of politicians. The flyers were all about 8 cm by 12 cm. The next morning I discovered why they were that size:

They fit perfectly in the toilet paper dispensers

In 1993, I returned to Poland for a Zakopane Krakow School:

I was much involved with understanding what might be done with heavy ions, but I lectured on electroweak baryon number violation. There were lectures by A. D. Krasny about Recent Results from the H1 experiment at Hera, and by A. D. Martin about Partons at Small x . Having these talks presented together forced me to think about the high density of partons at small x and how this means that one should be able to compute the initial distribution of gluons at small x at high enough energy. My interest in small x physics came from the meeting.

Michal was there, the perfect host, and the Berlin wall had long since fallen and Poland was a free country. The meeting was in the “summer vacation house” of one of the trade unions, and it had a swimming pool. There was music and dance. Michal looked very happy because he did not need to work so hard to get beer and food for the meeting. He also enjoyed the swimming pool and sauna.

Times were changing.

One afternoon, my wife Alice heard this most beautiful music and she walked around to look to see where it came from. She discovered Atsushi Nakamura playing the Pan Pipe. Atsushi is quite spectacularly good, and Atsushi is the number 2 Pan Pipe player in Japan.

I have been to Poland many many times since. Michal has recently been visiting Seattle. Michal and I developed a friendship and collaborated on several works together.



Zakopane
in 2006

Atsushi
playing with
the band for
the party at
Zakopane.

Ludwig Turko
charming my wife
Alice



Misha Shifman,
me and Alice in
1988

Michal shared with
me the secret of the
Zakopane “fruit
juice”.
70% ABV Polish
Kosher Slibowicz.
Be Happy!



Most recently, Michal helped me when I was trying to get my wife Olga out of Russia. This was complicated by Covid and the Ukraine-Russian war. I had intended to meet Olga in Poland because after a long period of time when it was impossible for Russians to get visas to enter the US, finally they could finally go to the US Embassy in Warsaw. But then the Polish Government said Russians could not come to Poland. So I stayed for a month in Michal's house in Krakow, waiting to see what I could do, ironically while Michal was visiting me in Seattle. Michal's wife Dorota is interested in the the ethnographic and social history of Polish culture around the world, particularly in America. At the turn of the 20'th century there were large Polish communities in the Pacific northwest involved in the mining and forestry work. It is nice to have the Prasalowicz family in Seattle. I also learned a little history of the places where I was born and raised.

(I eventually got Olga out through Belgrade with the help of a US Senator)



Olga,
arrived in Belgrade

Dorota and Michal
in Seattle



Physics with Michal:

Used his result in his famous work:

Three Gluon Integral Equation and Odd C Singlet Regge trajectories in QCD (with J. Kwiecinski)
Phys. Lett. B94 (1980) 413-416

Wrote 7 scientific papers with Michal:

Best known are

Saturation and Scaling of Multiplicity, Mean p_T and p_T Distributions from $200 \text{ GeV} < E < 7 \text{ GeV}$
Acta. Phys. Polon. B41 (2010) 1917

Transverse Momentum of Protons, Pions and Kaons in High Multiplicity pp and pA Collisions:
Evidence for the Color Glass Condensate

Nucl. Phys. A916 (2013) 210-218 Trace Anomaly and Conformality in Neutron Stars (with Y. Fujimoto and K. Fukushima)
Phy. Rev. Lett. 129 (2022) 25, 252702

I will try to convince him that Quarkyonic Matter is in ordinary nuclei.
I suspect he will not believe me.

But we will have some good wine and beer and some good jokes.
And then we will write a scientific paper.

We work well together. Michal is precise, accurate and spells out ideas in mathematical detail.
He is very energetic. (I wish I could be half as much.)

Famous People, Famous Things and the Age of 70



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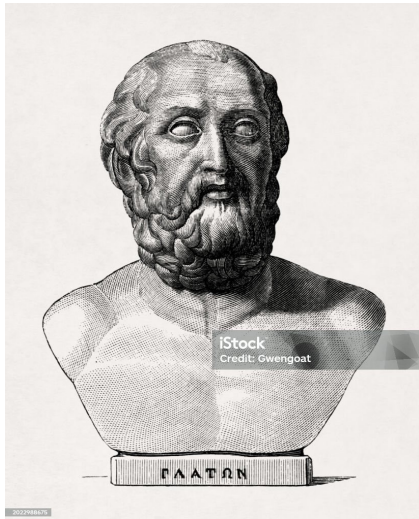
Ben Franklin

Picture on \$100 Bill
Signed the US
constitution at age 70
Scientific
accomplishments all
under the age of 50



Leonardo da Vinci

Mona Lisa and Last Supper painted
when in 40's
Would have done good stuff after he
was 70, but unfortunately died when
he was 67.
He was more famous after his death.



Plato

Wrote the Republic when
29-30 years old
BUT
Lived to be 90
Died in his bed while
young Thracian woman
played the flute for him.



Donald Trump

Forbes list of
wealthy people:
Age 36
Built Trump Tower
Age 36
President of USA
Age 70
Age 78?

Michal,

The following video is a 70'th Birthday is appropriate for your 70'th birthday. While you watch, remember that although you are now

VERY OLD,
there is still a
Little Pleasure
in life that remains.

It is important not to be too frightened by the video.
It is bad for your heart.

https://www.youtube.com/watch?v=sBmlLKzMA_s

