

# The Life and Times of Edward Shuryak

(For the celebration of his 60'th birthday)

Born September 6, 1948

Odessa, Ukraine





Odessa:

Ancient Greek colony of Olbia

As a city, result of

Russian-Turkish War of 1787-1792 => Russia

Duc de Richelieu: Escaped from “Terror” of French Revolution. Was mayor 1803-1814

1819-1859: Free Port: International city of Russian, Ukrainian, Jews, Romanians, Greeks, Bulgarians ..  
By 1897 almost 40% of population Jewish

20'th Century:

During revolution: Occupied by Reds, Whites, and French

Starvation during 1921-1922 and later during the collectivization of farms

Nazi Occupation: 60,000 Jews slaughtered

1970-1990: Majority of Jewish population emigrates

## One of Odessa's most famous citizens: Anna Akhmatova



Natan Altman portrait

Wind and honey has the scent of freedom,  
Dust -of a ray of sun,  
A girls mouth -of violet,  
And gold -has no perfume.

Watery -the mignonette,  
And like an apple -love,  
But we have found out forever,  
That blood smells only of blood

Anno Domini MCMXXI



Born 1889, Married to Nikolai Gumilov 1910, divorced 1918, Gumilov executed in 1921

Poetry banned 1925-1940

Married Vladimir Shilenko 1918, divorce 1928

Married Nikolai Punin, Punin Dies in Siberian labor camp 1953

Son imprisoned 1949-1956

Education: Novosibirsk State University 1970

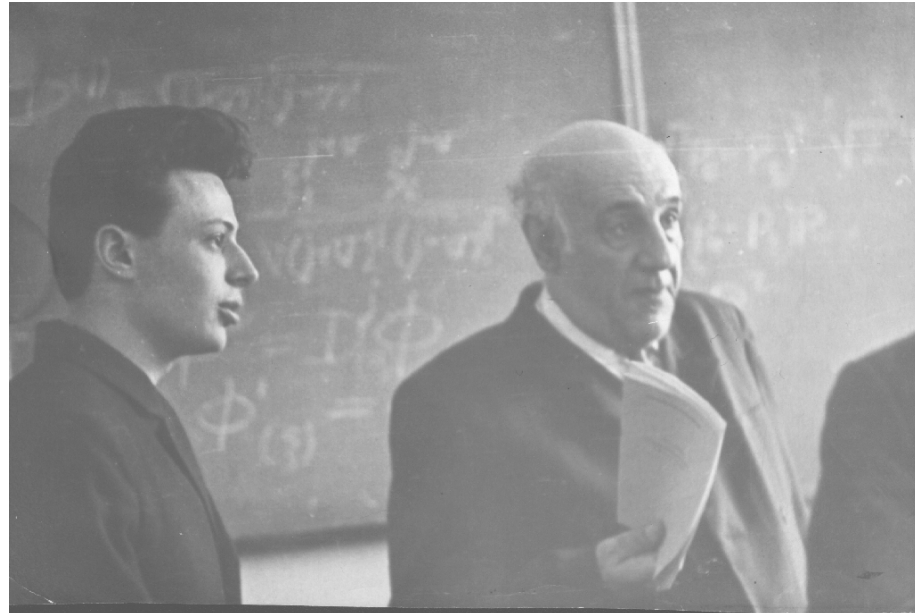
PhD Institute for Nuclear Physics: Novosibirsk

Full doctors degree 1982

Early career:

Junior to chief scientist, INP 1973-1989

Associate professor: Novosibirsk State U. 1975-1989



First teacher: Yu. B. Rumer: Educated Moscow University, worked with Max Born in Goettingen, returned to Russia 1933, was arrested shortly thereafter and spent 20 years in camps and exile. Rehabilitated under Krushchev, became director of Radio-physics Institute in Novosibirsk, Professor in Novosibirsk University and researcher in Budker Institute

Edward learned the word Quark from Rumer





PhD Advisor: Spartak Belyaev:

Two principles:

Theorists must grow through asphalt.

I will never accept a student or post-doc who cannot fill out his own forms.

Eventually became a rector of Novosibirsk State University



Vladimir Zhelevinskii

Tried to get Edward into nuclear physics. Cranking model for  $SU(3)$ . Remembers him as good lecturer and teacher.

Edward was never interested in nuclear physics.



Siberia

# Shuryak's Early Work:

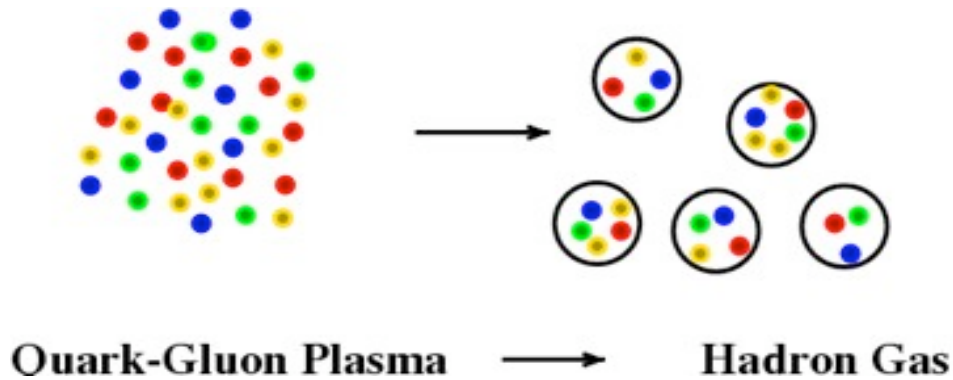
Always drink upstream from the herd.

Will Rogers

Multi-particle production and Landau hydrodynamics,

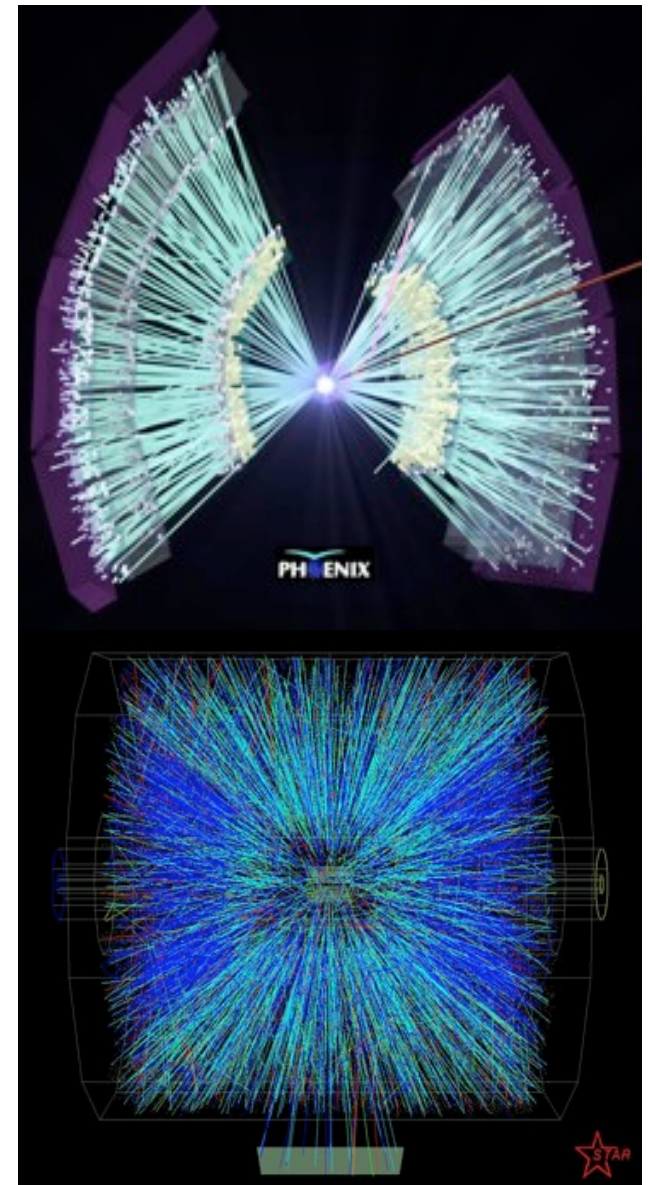
Theory of the hadronic plasma

Quark Gluon Plasma and production of leptons,  
photons and psions



If you're riding ahead of the herd, take a look  
back now and then to see if it's still there.

Will Rogers





Top: Shuryak as translator for Budker and Panofsky;

Above left :Skrinsky

Right: Flambaum in Australia

First met Edward on his first trip to west in Bad Honnef, Germany, 1984

First International Workshop on Local Equilibrium in Strong Interaction Dynamics

Organized by Richard Weiner

Mean free path in strong interactions

(My talk: Mean free paths, viscosity and the limitations of perfect fluid hydrodynamics in the description of the quark gluon plasma)



Edward Shuryak and Evgenii Feinberg



Physikzentrum at Bad Honnef

Paraphrase Will Rogers:

There are two theories about how to win an argument with Edward Shuryak: Both of them are wrong.

1986 met Edward in Novosibirsk



English -> Chinese -> English

Out of sight, out of mind -> Invisible  
Insanity

English -> Japanese - English

Grapes of Wrath -> Angry Raisins



Edward was writing a Physics Report:

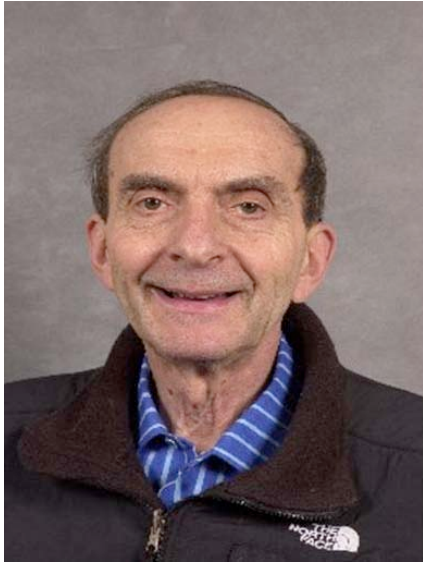
Novosibirsk had homemade personal computers  
constructed from KayMaks

Edward had written a program which translated  
his English into Russian so that the Russian  
version can be approved by KGB

The spirit is willing but the flesh is weak

=> Russian =>

The vodka is good, but the meat's gone bad



## 1988-1989: Edward Visits Cern for One Year

USSR was allowing people to visit outside the country. I had moved to U of Minnesota and was recruiting Russian visitors to Fine Theoretical Physics Institute, some stayed.

I visit CERN and Edward invites me outside for walk. Tells me he is planning to legally emigrate from Russia. Asks about job possibility in US. I mention possibility of BNL or Stony Brook, and call up Sid Kahana. Sid talks with Gerry Brown, and they begin negotiations. In QM88, In Lennox, I arrange a years invitation to U of M as backup for authorities

Edward receives permission to leave and is put in refugee center in Italy. Gerry watches over the process VERY CAREFULLY.



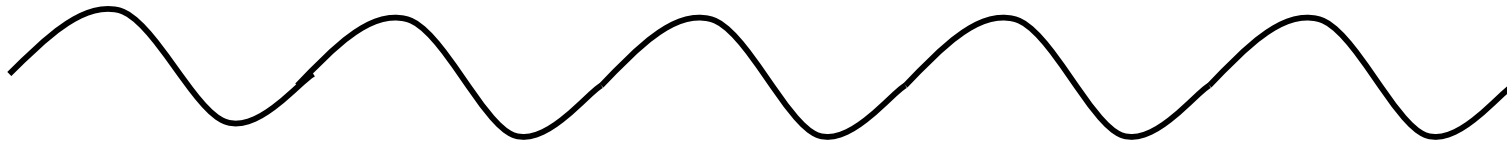
1988 in Nor Amberd, Armenia

Edward photographer:

In order:

Alice McLerran, Akady Vainshtein,  
Alyesha Yung, Larry McLerran,  
Misha Shifman, Valery Rubakov,  
David Gross, unknown, Misha  
Shaposhnikov, unknown

# Edward's Physics: Late 80's and Early 90's

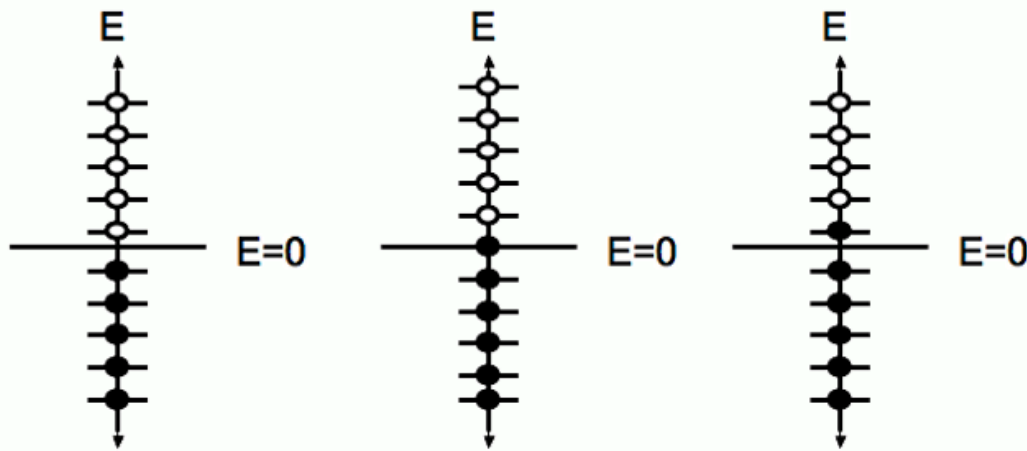
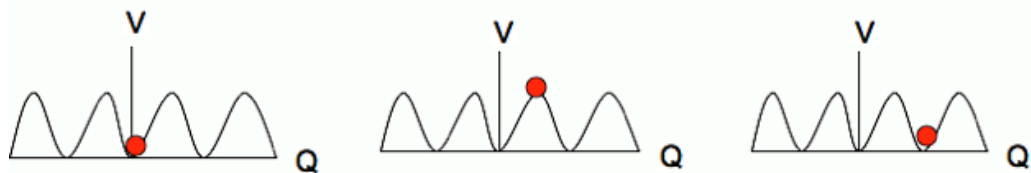


Each minimum is equivalent world:

Two ways to make transitions:

Have enough energy to climb over the top: Sphaleron Transitions

Tunnel under the hill: Instantons



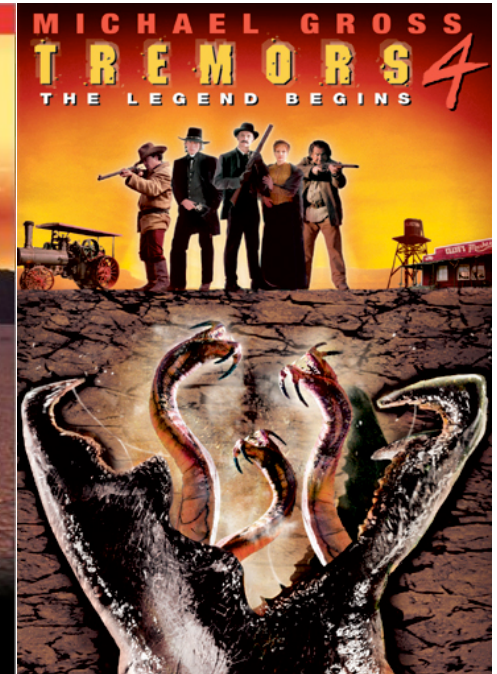
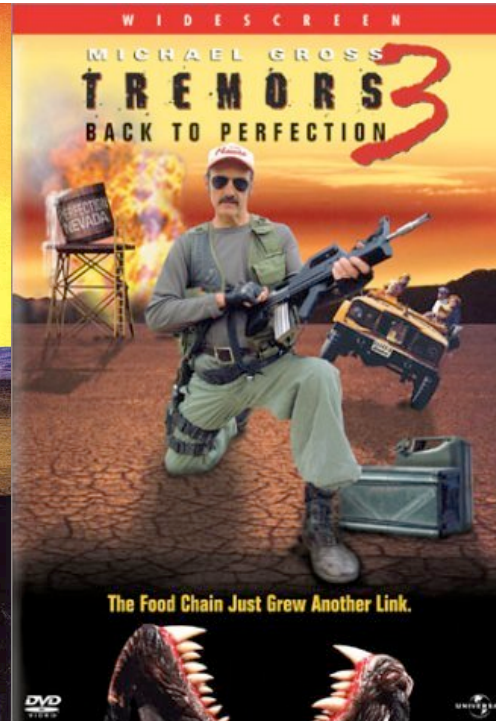
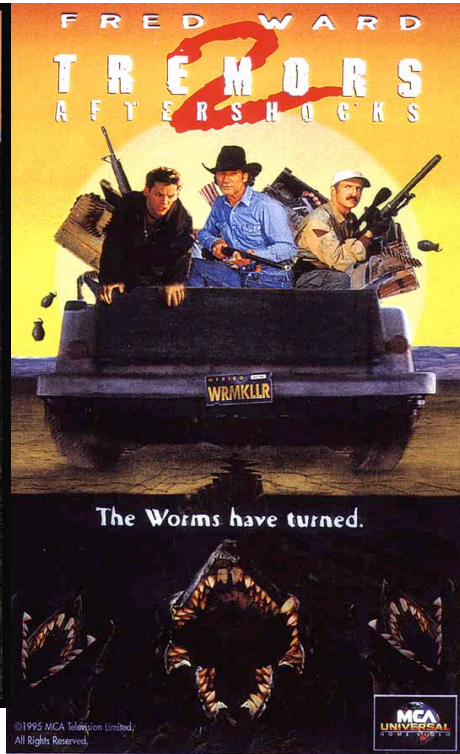
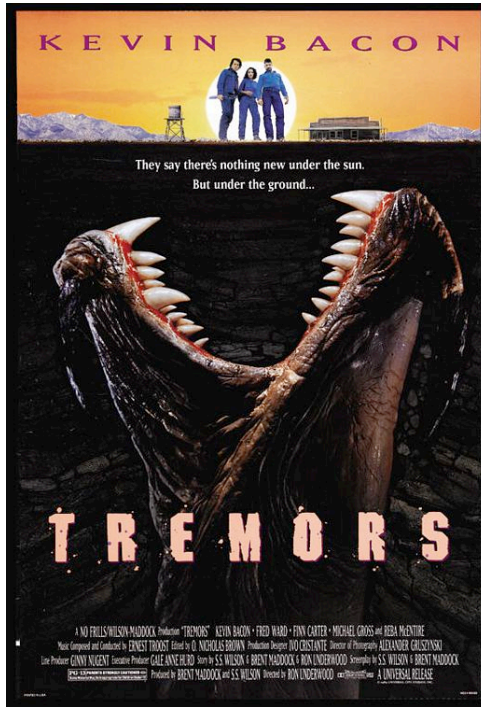
Vacuum

States halfway through change of electroweak fields

State after electroweak fields are in new vacuum configuration

A new phenomena:  
Confinement?  
Mass Generation?  
Baryon-Asymmetry?

# Instantons $\Leftrightarrow$ Worms



Great Enthusiasm:

Towards a Theory of Strong interactions

Callan, Dashen and Gross

Role of Instantons in Strong Interactions: 1-3

E. Shuryak

Theory and Phenomenology of QCD Vacuum 1-8

E. Shuryak

A Modest Enquiry  
Into the Nature of  
**Witchcraft,**

A N D

How Persons Guilty of that Crime  
may be *Convicted*: And the means  
used for their Discovery Discussed,  
both *Negatively* and *Affirmatively*,  
according to *SCRIPTURE* and  
*EXPERIENCE*.

By **John Hale,**

Pastor of the Church of Christ in *Beverley*,  
*Anno Domini. 1697.*

*When they say unto you, seek unto them that have  
Familiar Spirits and unto Wizards, that prep,&c.  
To the Law and to the Testimony; if they speak  
not according to this word, it is because there is no  
light in them, Isaiah VIII. 19, 20.  
That which I see not teach thou me, Job 34. 32.*

B O S T O N in N. E.

Printed by *B. Green,* and *J. Allen,* for  
*Benjamin Eliot* under the Town House: 1702

Nobody likes me,  
Everybody hates me,  
I'm gonna eat some worms

Long slim slimy ones,  
Short fat juicy ones,  
Itsy bitsy fuzzy wuzzy worms

Nobody likes me,  
Everybody hates me,  
I'm gonna eat some worms

First you get a bucket,  
Then you get a shovel,  
Look how they wiggle and  
squirm

Nobody likes me,  
Everybody hates me,  
I'm gonna eat some worms

First you pull the heads off,  
Then you suck the guts out,  
Oh how they wiggle and  
squirm

Nobody likes me,  
Everybody hates me,  
I'm gonna eat some worms



Don't gamble: Take all your money and buy some good stock and hold it. If it goes up, then sell it. If it don't go up, don't buy it.

Will Rogers

QCD at High Density and Low Temperature:

Collaborators; Verbaarschot, Shafer, Rapp, Velkovsky, Rajagopal, Stephanov

Most cited work on Color Superconductivity



Most recent work:

Phenomenology of RHIC collisions

Hydrodynamics

Mach Cones

Ridge

sQGP

Yellow, Red, Blue 1925,  
Kandinsky,

Pompidou Centre, Paris



Left: John Negele, Victor and Natasha Novikov, Larry and Alice McLerran;

Right: Victor and Natasha Novikov, Gabriel Karl and Edward Aspen 1991



Stan Mroczwzyskii and Edward in Schladming

John Paul and Joelle Blaizot; Edward, George Ripka, Trento

Edward and Jac Verbaarschot



*For Edward from all his  
good friends:*

*Happy 60'th Birthday!*

