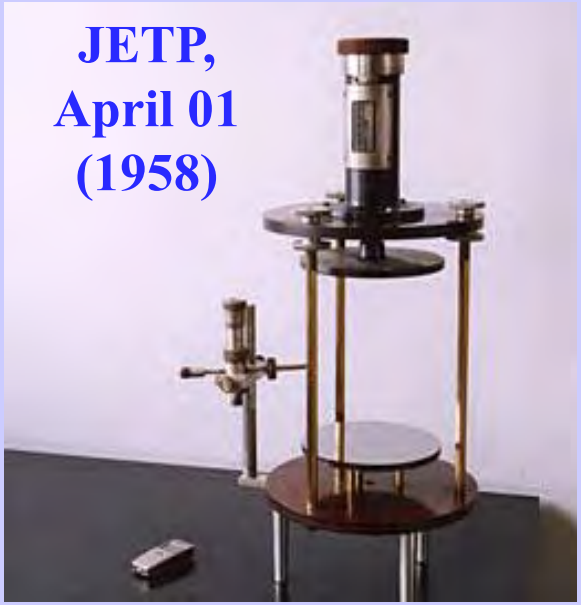
Prokhorov General Physics Institute of RAS

ИОФ РАН

Moscow July 09 (2015)

JETP, April 01 (1958)

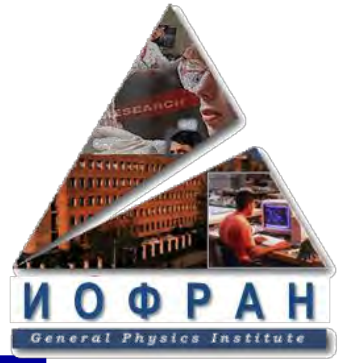


Nobel Prize, November (1964).

Maser with open cavity

Cavitation increases of the H2O spin-isomer ortho/para ratio in water and decreases its viscosity

Sergey Pershin



Сергей Михайлович ПЕРШИН
Д.ф.-м.н. главный научный сотрудник
Институт общей физики им. А.М.Прохорова РАН
pershin@kapella.gpi.ru

Памяти академика Коновалова А.И.

Academician Konovalov A.I.
initiated of our Conference
“Physics of aqueous solutions”

После второго доклада на семинаре Щербакова И.А. В ИОФ РАН в 2015 г. Александр Иванович сказал:

«Если физики взялись за изучение воды – будет дело!»

Academician Konovalov Alexander
Academician Ivan Shcherbakov
Academician Oleg Rudenko
Academician Robert Nigmatulin
Academician Kev Salikhov
Dr. V. Stebnovsky

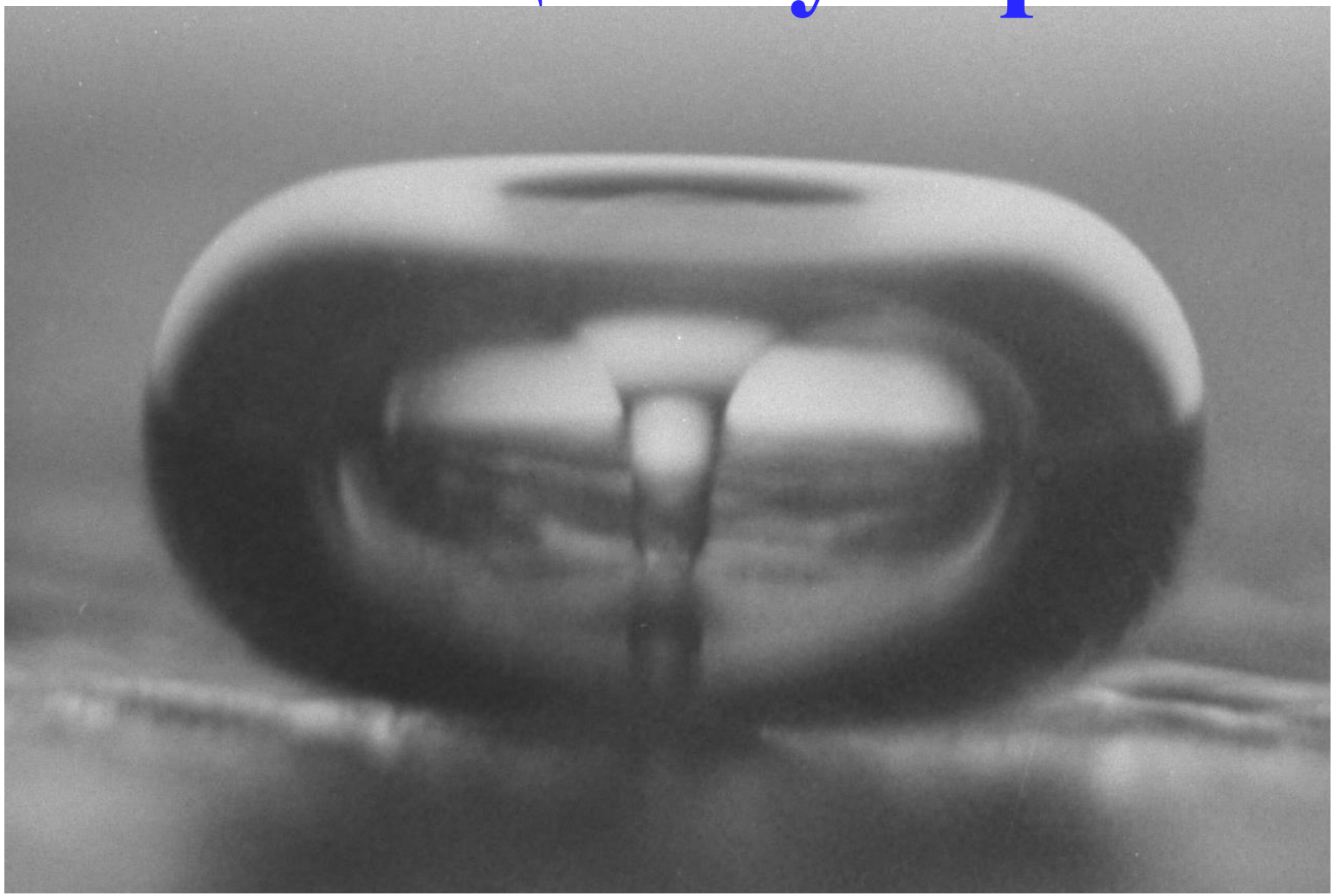
Академик РАН Александр Иванович Коновалов
30.01.1934 – 04.05.2021

Crum L.A. J. Physique, v.40, 285 (1979)

Temp.
up to
25 000 K
and
P
up to
KBar

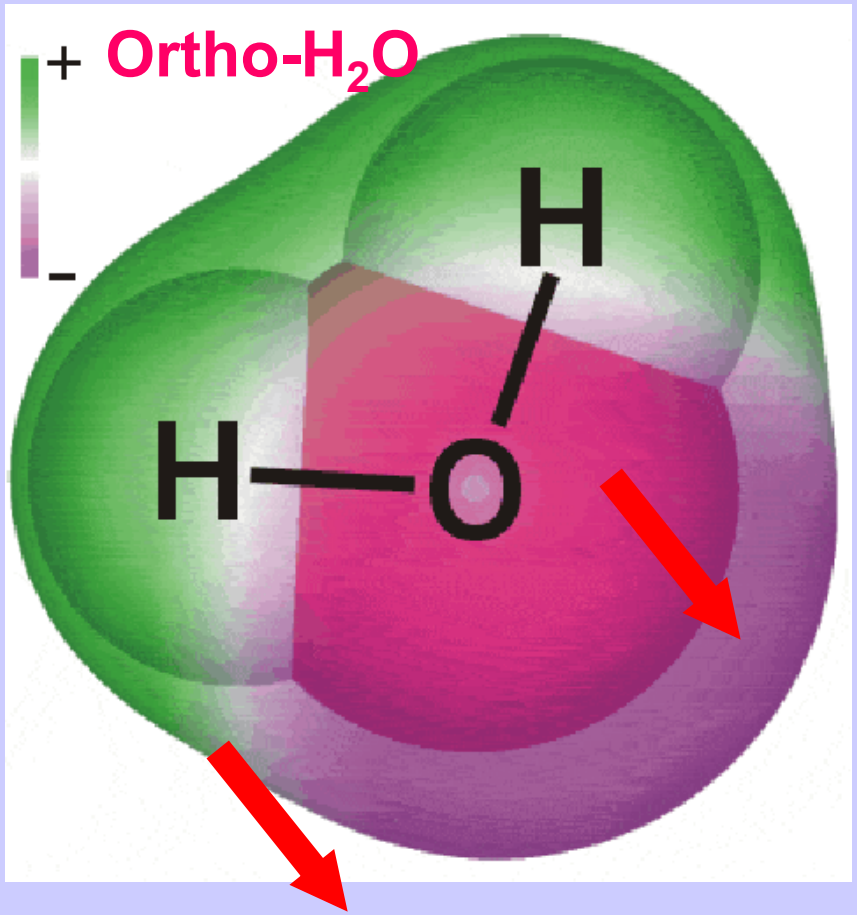
What about
O/P H_2O?

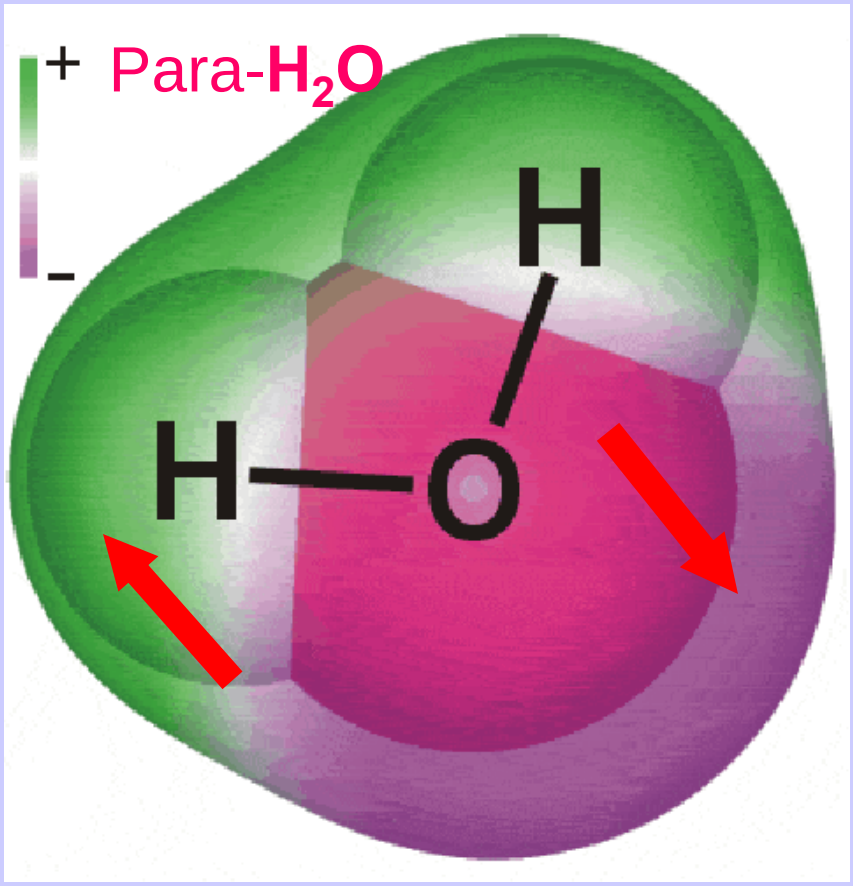
Кавитация пузырька



Crum L. J. Physique, v.40, 285 (1979)

Ortho and Para spin isomer of H_2O

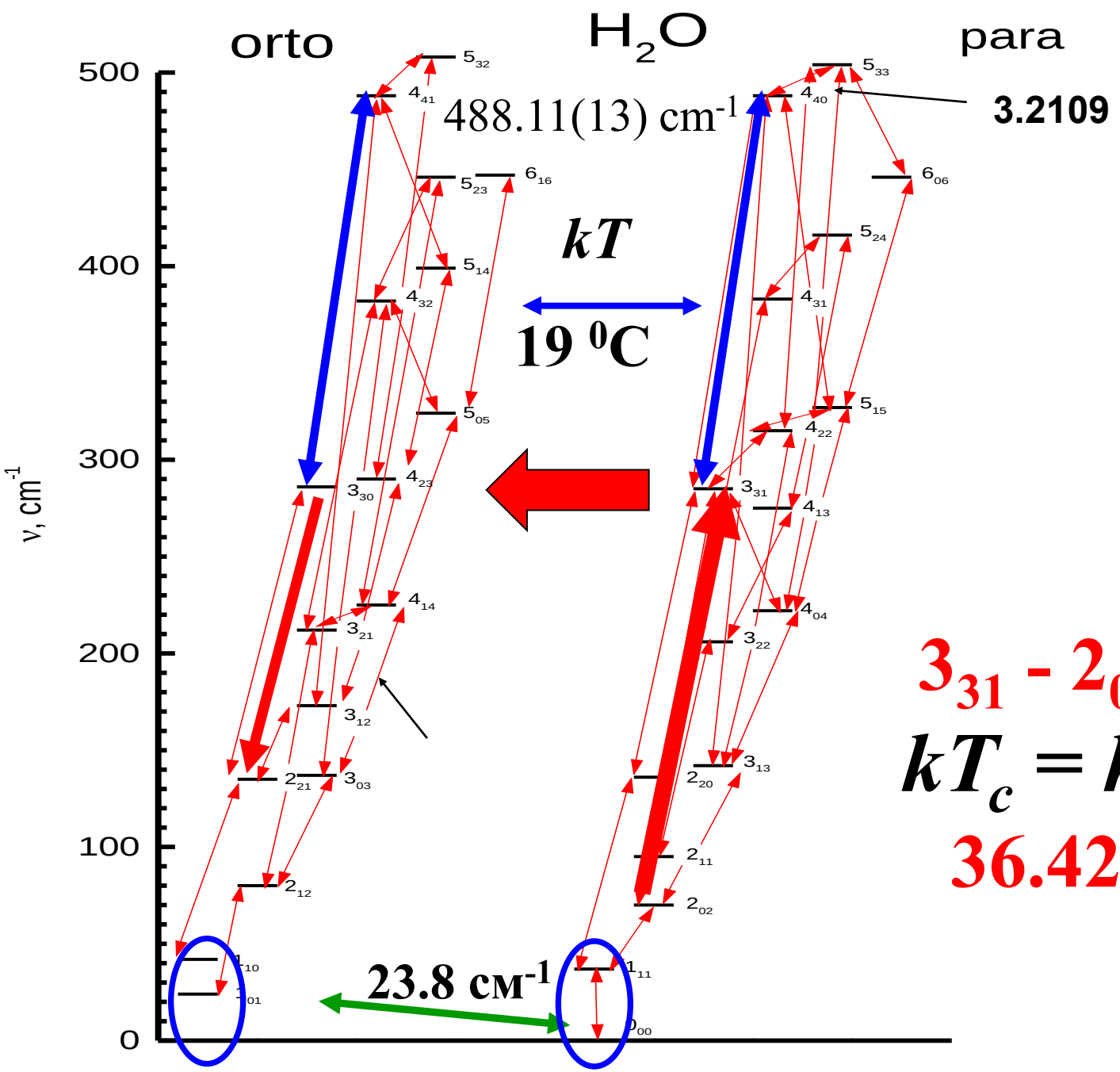




Ortho/Para ratio is **3:1** in water vapor at 300 K

but **1:1** **in normal liquid water**

Energy Diagram



Cavitation chamber

US patent 6,521,248

P =11атм (150 psig)

Recycling up to

T~ 60 ^{0}C

5 vortex nozziles on the same plane

0.5 ppm of total dissolved substances (TDS).

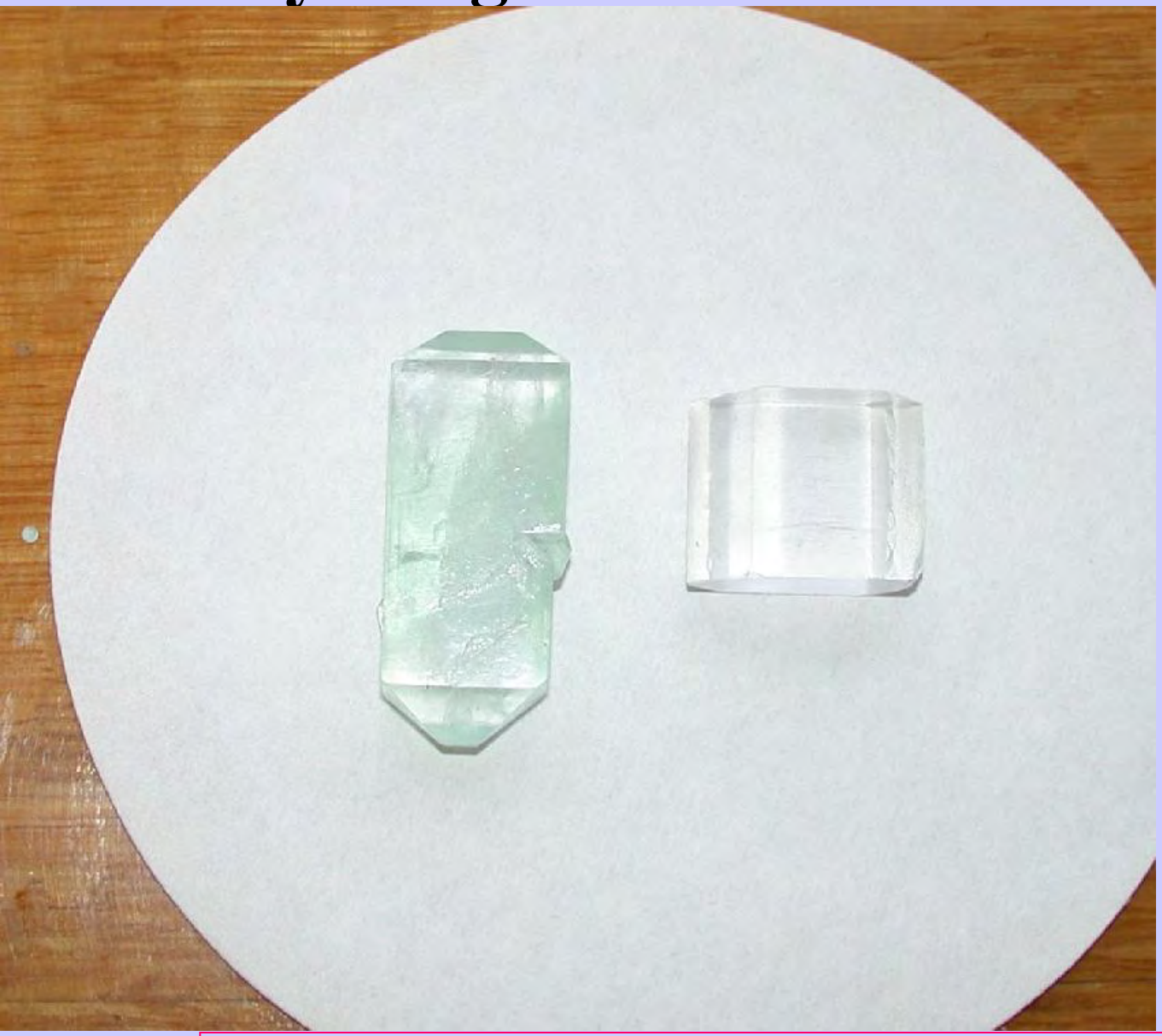
Cavitation increases of the H_2O spin-isomer ortho/para ratio in water and decreases its viscosity

In 2004 we have got the cavitation treatment water sample from USA and study its properties by Four-wave mixing spectroscopy: water is non-equilibrium liquids in spin temperature with O/P=1:1 instead of 3:1at 300 K

Chapovsky P.: O/P = 0.1:1 at ~ 0 K

Before our sets Dr. Diakov and Rashkovich from MSU used the same water sample to grow the crystals and dissolved the kidney stones: calcium oxalate and hen eggs also

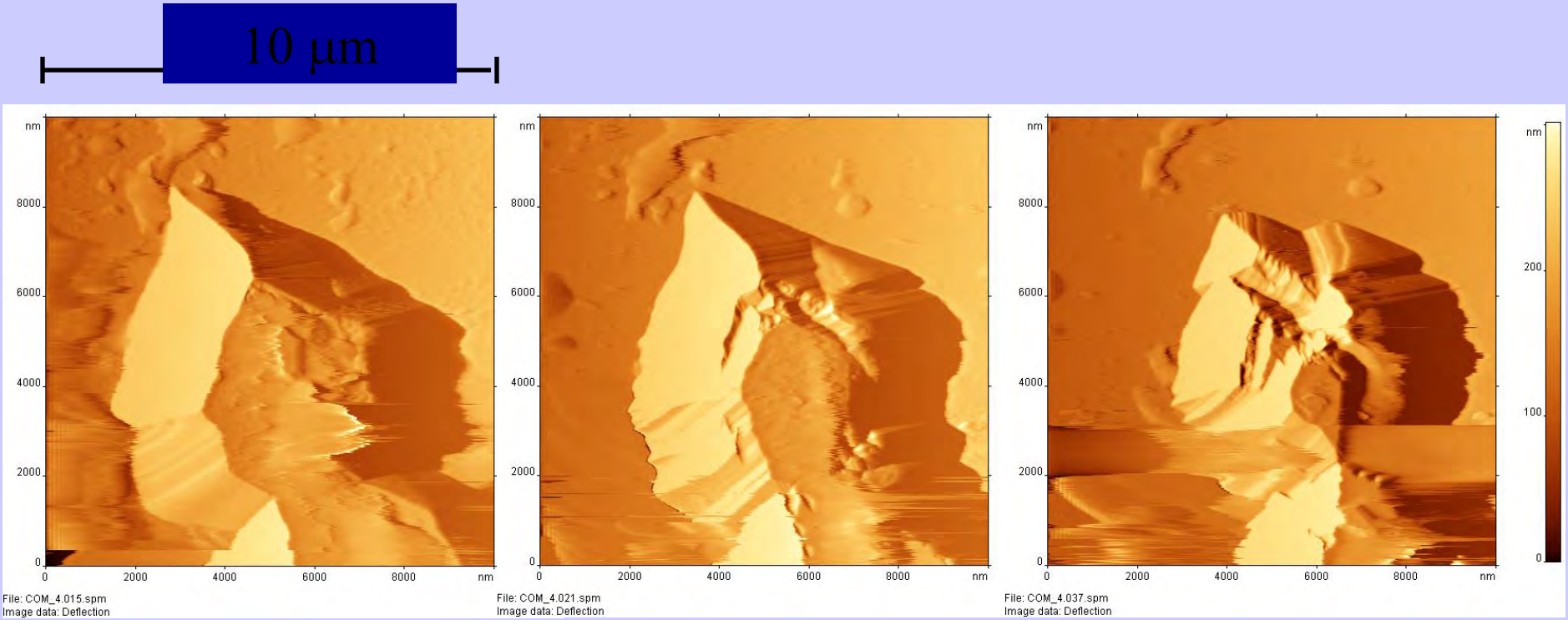
KDP crystal growth in cavitation trmnt water



- KDP crystal grown in CavTrm water (left) and
-
- in distilled water (right)

Dr. Alexey Dyakov, Moscow State University, 2002

Dynamics of Dissolving Calcium Oxalate Monohydrate Crystal in Penta Water



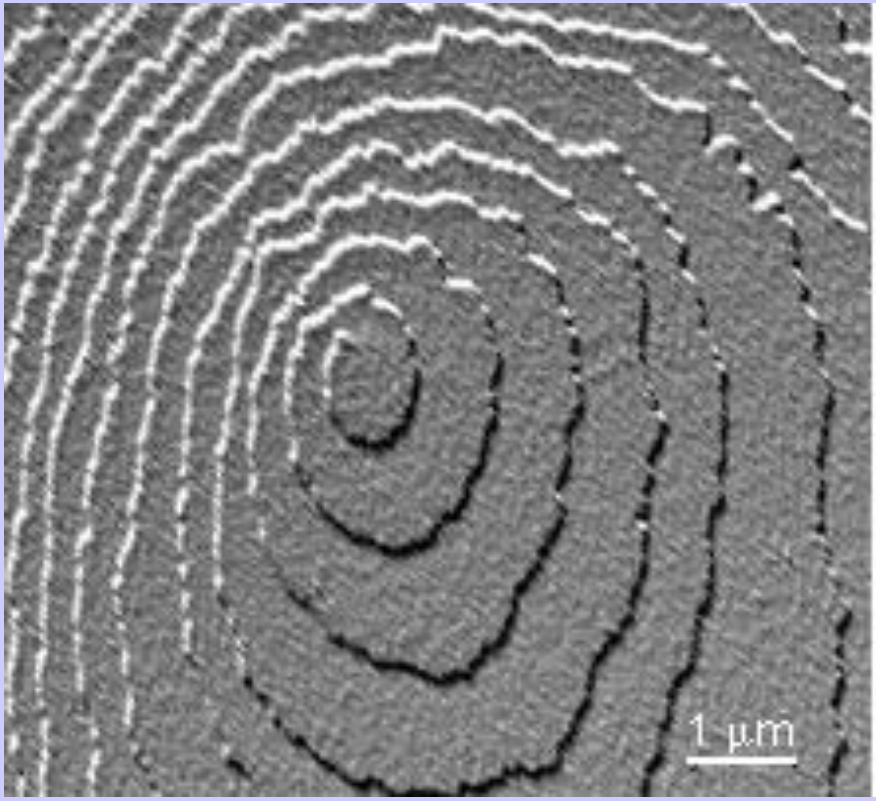
6 **49** **121** **min**

Atomic force microscopy

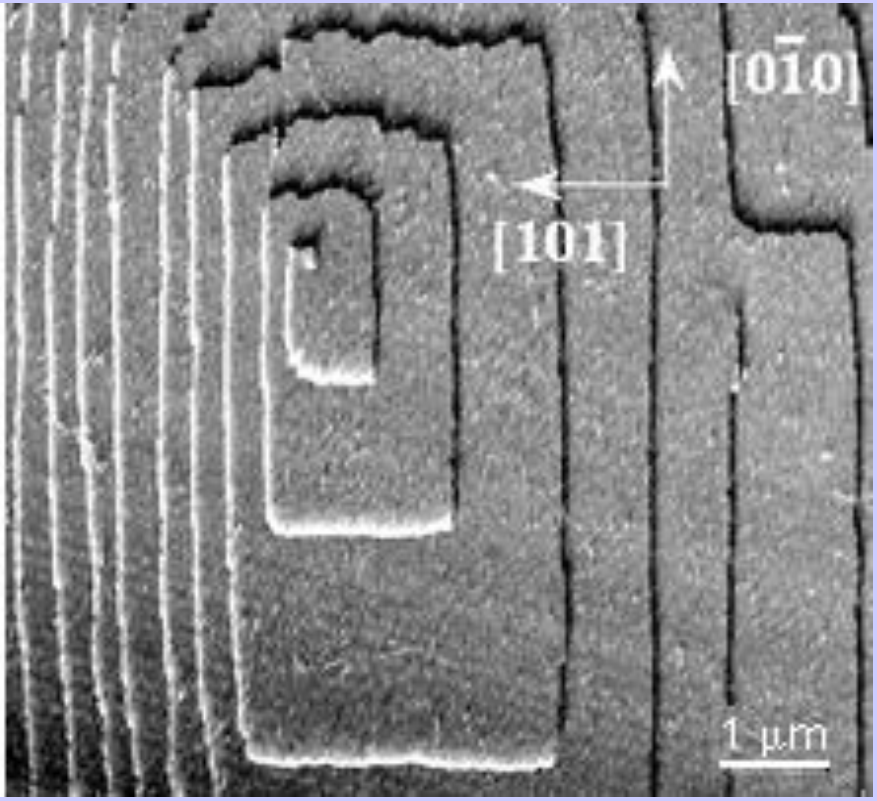
Water flow is 125 μl/min through the flow-cell (V=25 mm³), MSU, 2002

N.V. Gvozdev, E.V. Petrova, T.G. Chernevich, O.A. Shustin, L.N. Rashkovich, Atomic-force microscopy of growth and dissolution of calcium oxalate monohydrate (COM) Crystals, Journal of Crystal Growth, 261, 539–548 (2004).

Lyzosyme crystal growth in PENTA water



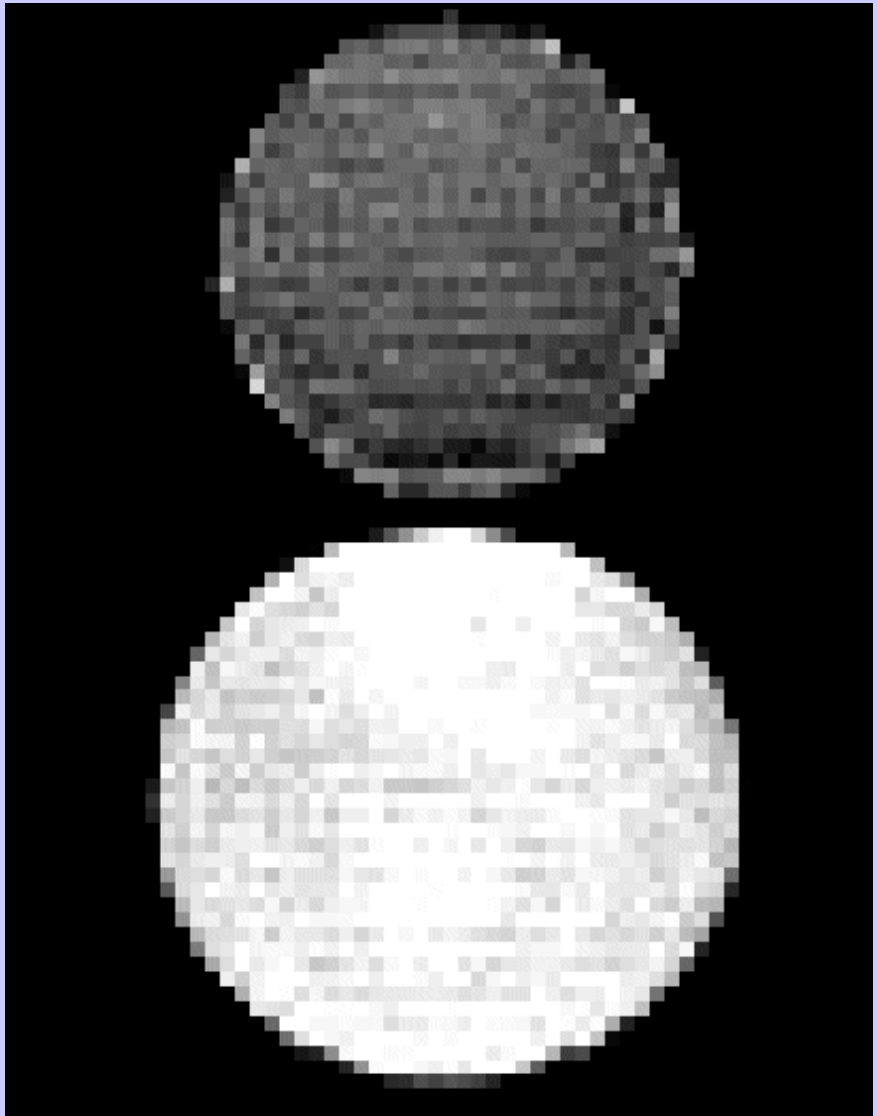
in PENTA water



in distilled water

МРТ изображение Milli-q и Cav-water

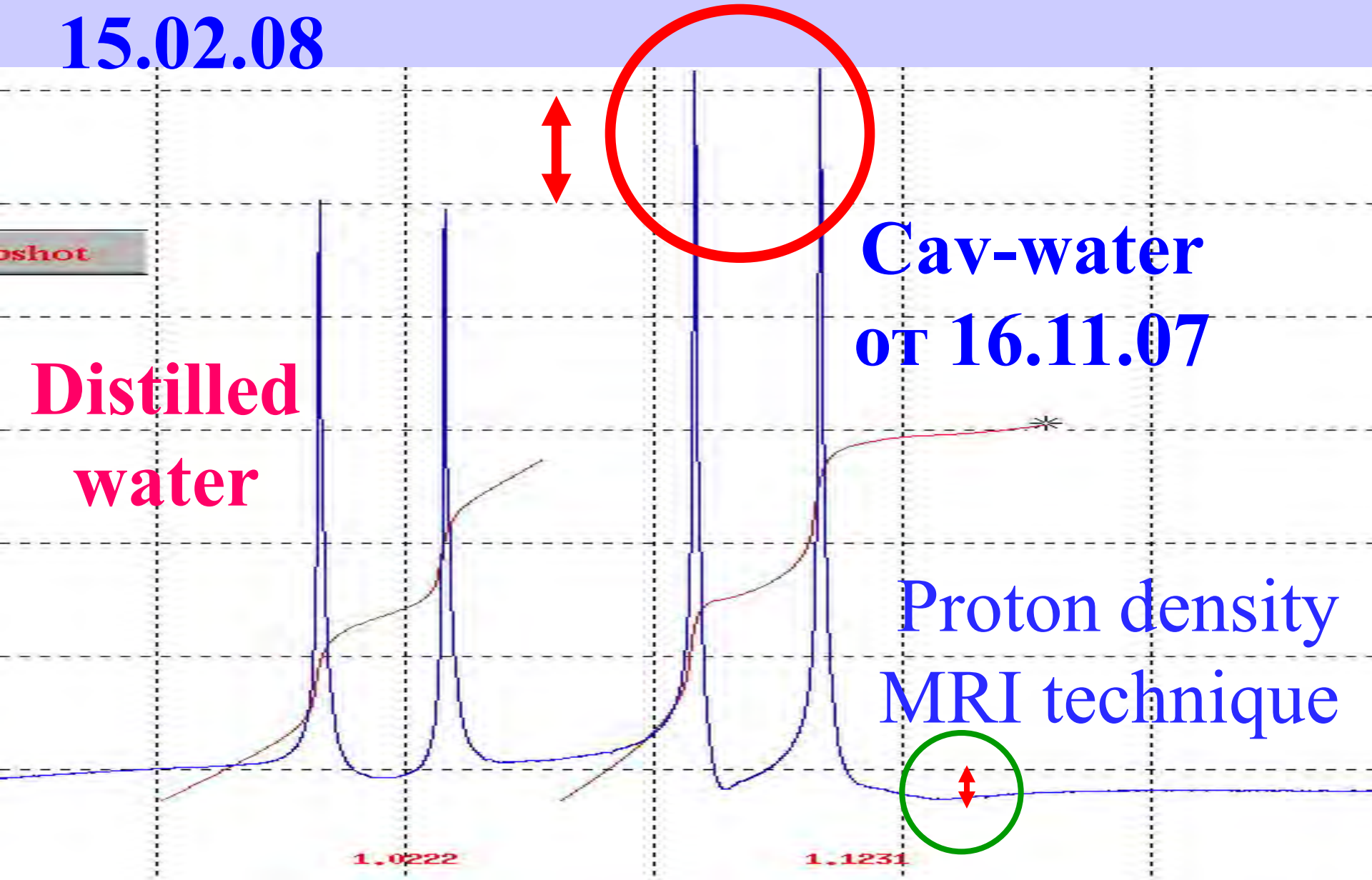
Fresh Milli-q вода

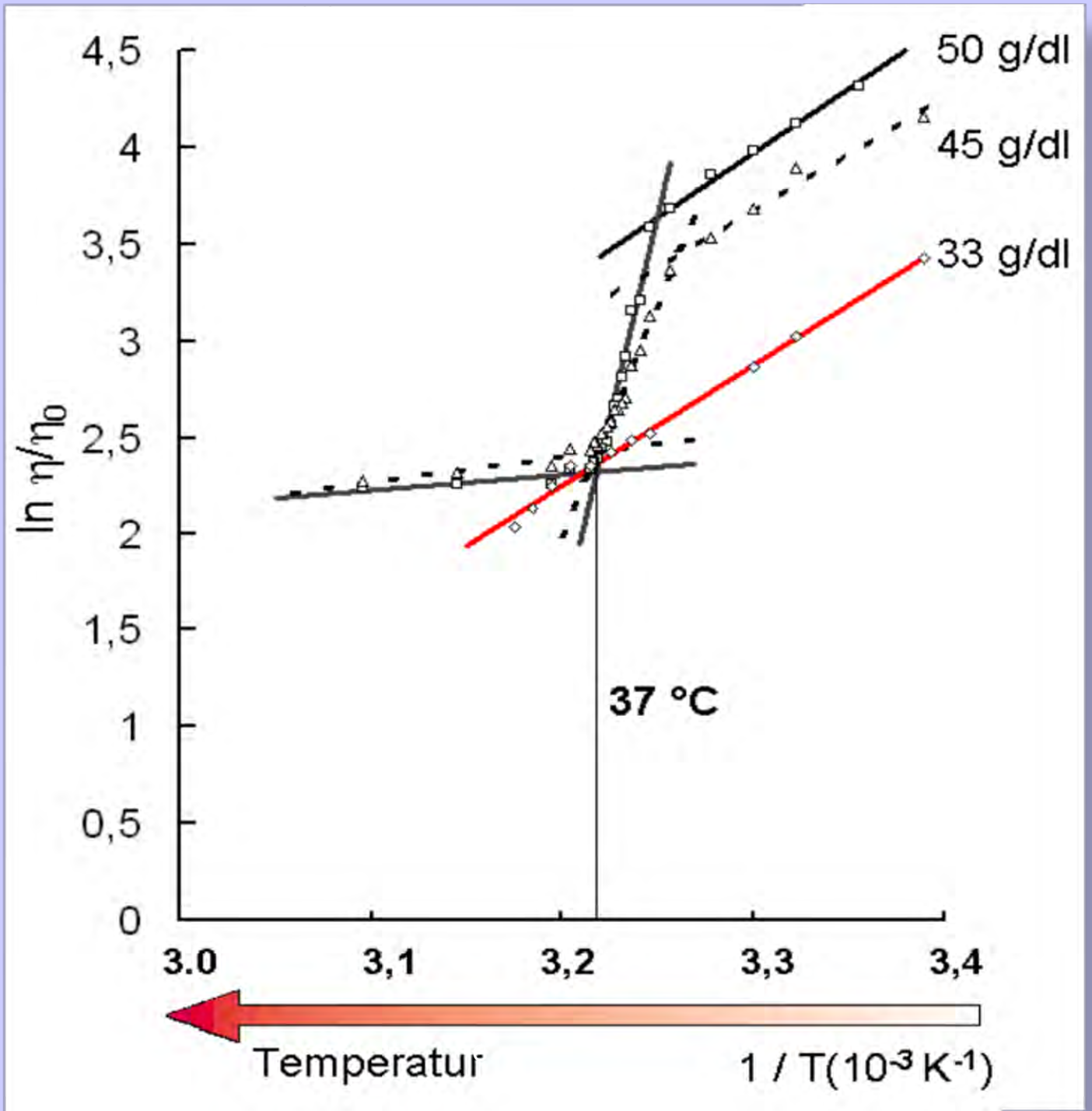


Cav-water 15 March 2007

Enrichment Cav-water by Ortho-H_2O

15.02.08

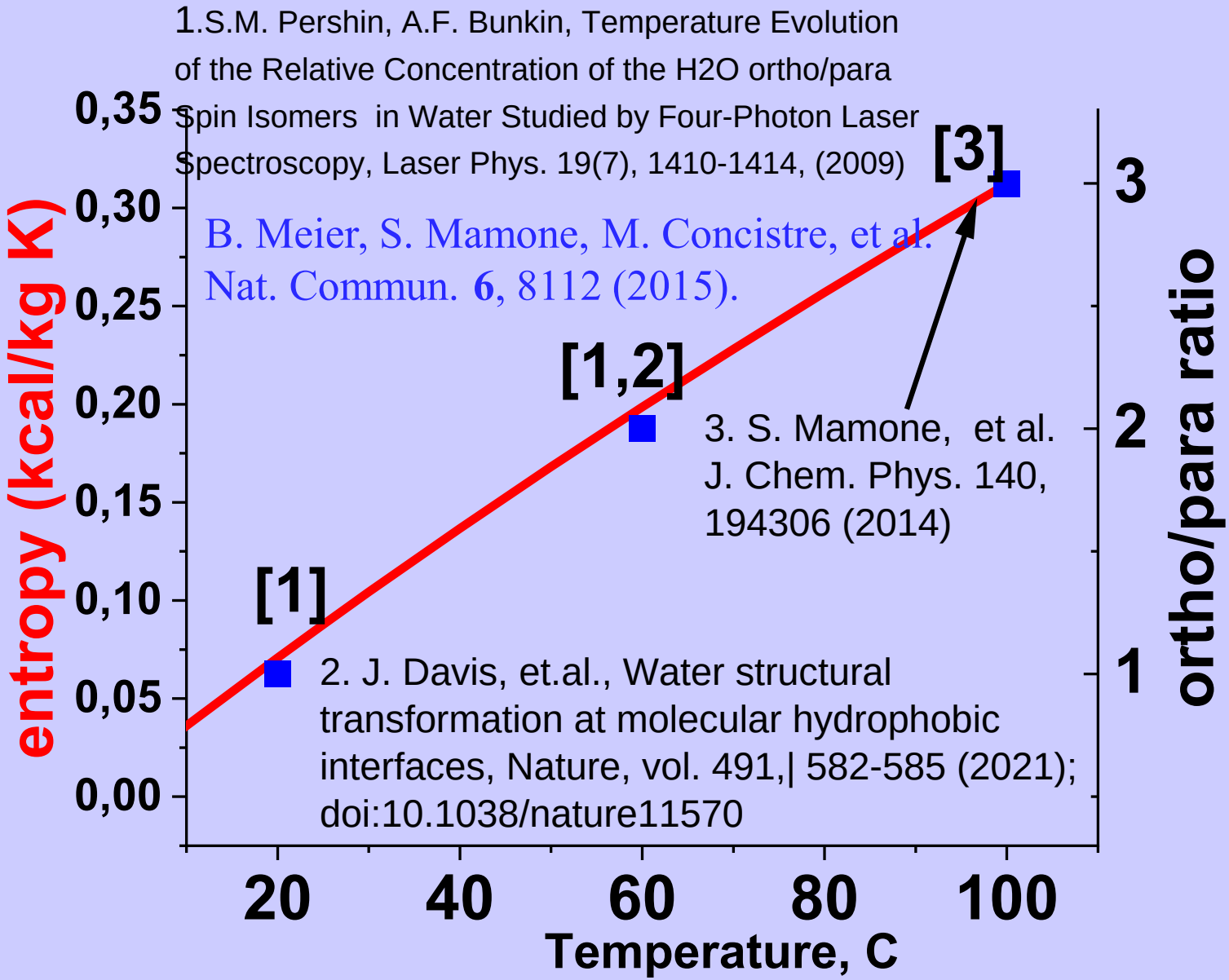




Gerhard Artmann, 1998

Hb suspension viscosity reducing faster !!! vs concentration at ~37 ^{0}C

Correlation water entropy with OPR



Conclusion

The ortho/para ratio is the most important parameters of water

Наставники в МГУ

Хохлов Рем Викторович
07. 15. 1926 – 08. 8. 1977

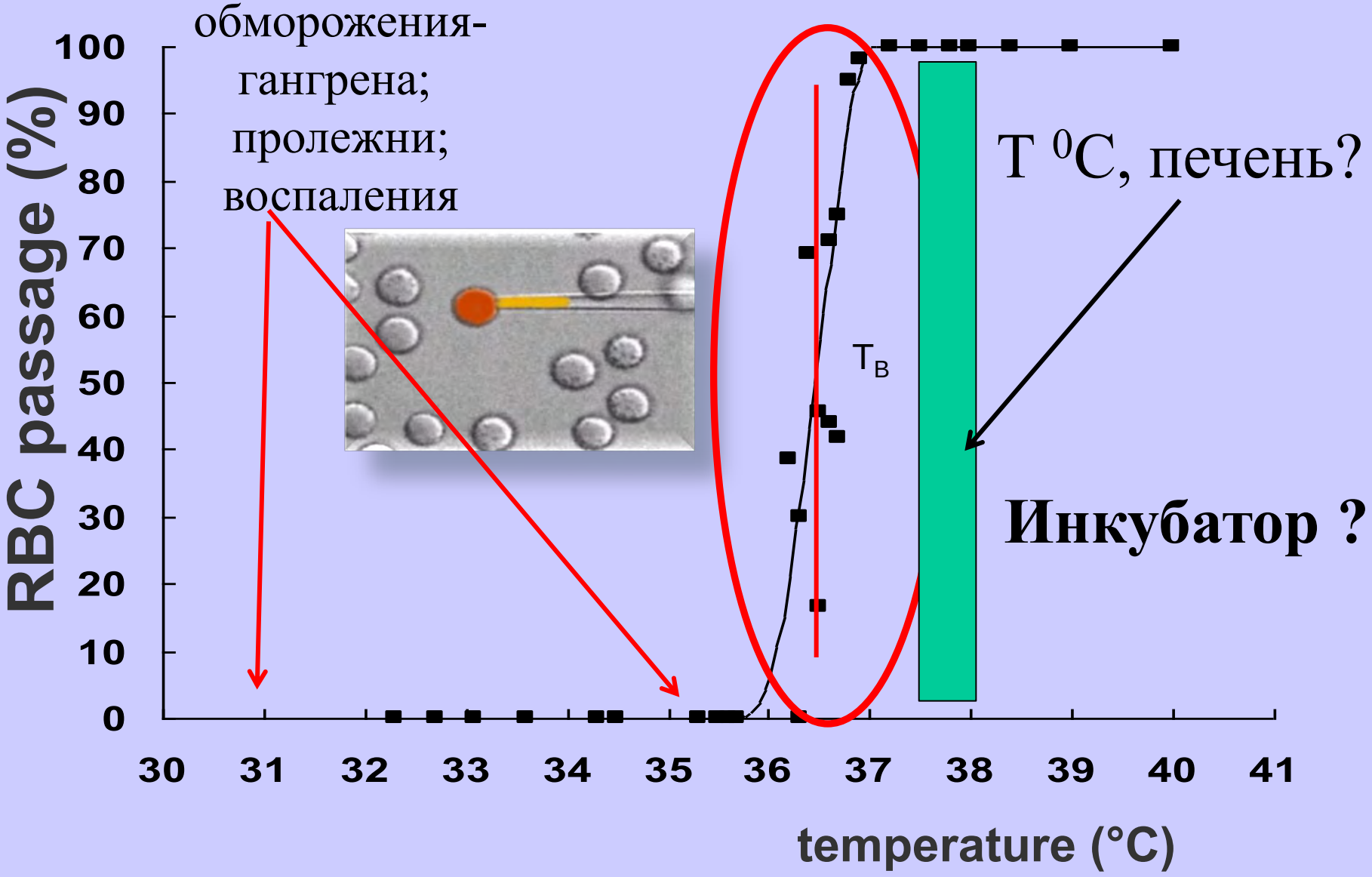
академик,
ректор МГУ (1973-1977гг),
зав. каф. Волновых Процессов

Ахманов Сергей Александрович
14.07.1929 – 1.07.1991

Профессор физфака МГУ
зав. кафедрой ОФ и ВП
мой научный руководитель

The Effect Occurs Step-like at Body Temperature

GM. Artmann et al. Biophys. J., 75, 3179 (1998)



Орошение бластодиска: орто-H_2O

Транспорт H_2O в клетку $3x10^9$ сек$^{-1}$

диаметр водного канала = 3 A^0 (!!!); Peter Agre, 2003г