Numerical renormalization group

Rok Žitko

Jožef Stefan institute

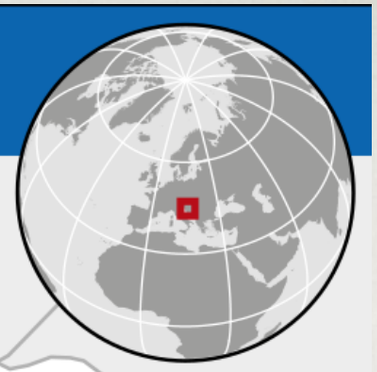
and

Faculty of Mathematics and Physics, University of Ljubljana, Slovenia

Uberlandia school of advanced studies, January 2019



SLOVENIA



AUSTRIA

HUNGARY

ITALY

CROATIA

BOSNIA AND HERZEGOVINA

Murska Sobota

Maribor

Ptuj

Velenje

Jesenice

Kamnik

Celje

Kranj

Trbovlje

Ljubljana

Novo Mesto

Koper

Adriatic Sea

25 km

Republic of Slovenia

Republika Slovenija (Slovene)



Flag



Coat of arms

Anthem: *Zdravljica*

A Toast[i]



Yugoslavia in 1989


2500m
2000m
1500m
1000m
750m
500m
250m
100m
0
N
NW
NE
W
E
SW
SE
S
16°
15°
14°
46°
CARINTHIA
KOZJAK
POHORJE
KARAVANKE
JULISKE ALPE
KAMNIŠKO SAVINJSKE ALPE
GORIČKO
PREKMURJE
SLOVENSKE GORICE
HALOZE
STYRIA
UPPER CARNIOLA
MENINA
POSAVSKO HRIBOVJE
KOZJANSKO
ŠKOFJELOSKO HRIBOVJE
POLHOGRAJSKO HRIBOVJE
TRNOVSKI GOZD
INNER CARNIOLA
LOWER CARNIOLA
SUHA KRAJINA
KOČEVSKI ROG
BELA KRAJINA
GORJANCI
JAVORNIKI
GOTENIŠKA GORA
BRKINI
KRAS
ISTRIA
GORIZIA
Adriatic Sea
Gulf of Trieste
Mangart 2679
Triglav 2864
Krn 2244
Stol/ Hochstuhl 2236
Peca/ Petzen 2125
Grintavec 2558
Črni vrh 1543
Nanos 1313
Krim 1107
Snežnik 1796
Slavnik 1028
1204
Boč 978
Trdinov vrh 1178
Visoki Rog 1099
Golak 1495
Jesenice
Bovec
Bled
Radovljica
Lake Bohinj
Most na Soči
Škofja Loka
Idrija
Nova Gorica
Ajdovščina
Vrhnika
Logatec
Cerknica
Postojna
Pivka
Ilirska Bistrica
Kamnik
Domžale
LJUBLJANA
Litija
Grosuplje
Ivančna Gorica
Zagorje ob Savi
Trbovlje
Hrastnik
Dravograd
Ravne na Koroškem
Slovenj Gradec
Mozirje
Velenje
Žalec
CELJE
Šoštanj
Sevnica
Krško
Brežice
NOVO MESTO
Kočevje
Ribnica
Črnomelj
Metlika
Rogaška Slatina
Slovenska Bistrica
Ptuj
Ormož
MARIBOR
Lenart
Gornja Radgona
Bad Radkersburg
Murska Sobota
Lendava
Mura
Drava
Dravinja
Sava
Soča
Idrija
Krka
MONFALCONE
TRIESTE
Muggia
Izola/Isola
Koper/ Capodistria
Piran/Pirano
Kranj
Šoštanj
Šentjur
Šmarje pri Jelšah
Ptuj
Ormož
Lendava
Črnomelj
Metlika
Brežice
Krško
Sevnica
Litija
Trbovlje
Hrastnik
Zagorje ob Savi
Šoštanj
Šentjur
Šmarje pri Jelšah
LEGEND:
National border of Slovenia
Capital (Slovenia)
Regional capital (Italy)
Other towns
Urban area (only for the settlements with over 25.000 inhabitants)
Expressway
Other important route
Railroad
Road tunnel
Railroad tunnel
Landing strip
Airport
Port
LOWER CARNIOLA Historical region
MENINA Geographical unit / region
Visoki Rog 1099 Summit with altitude (meters)
Krka River
Lake
0
(km)
100
0
(mi)
60







Ljubljana

[lublana]



Jožef Stefan Institute

www.ijs.si

Jožef Stefan

(1835-1893)

$$j = \sigma T^4$$



University of Ljubljana

Faculty for mathematics and physics

www.fmf.uni-lj.si



Rok Žitko

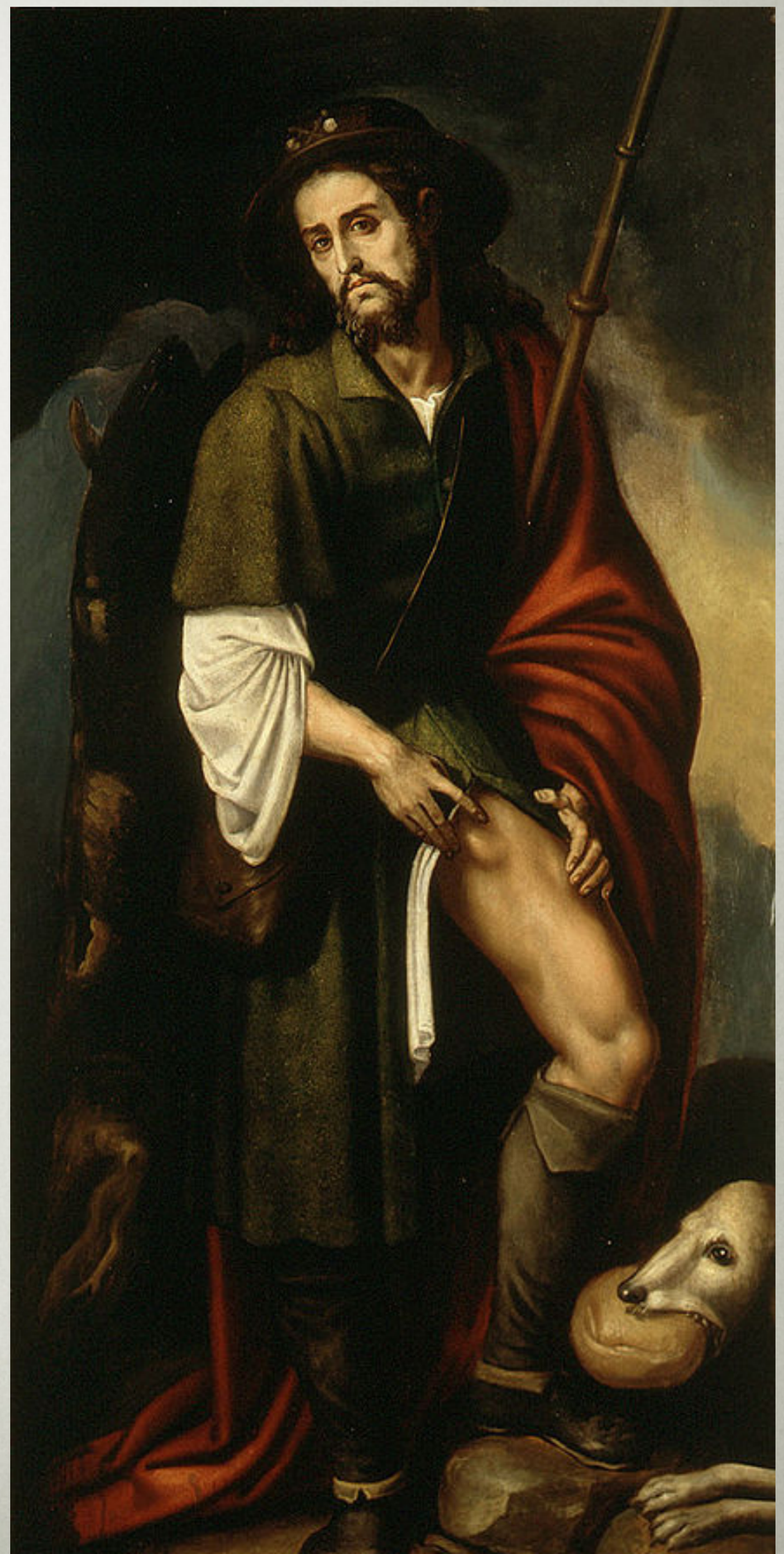
A a	B b	C c	Č č	D d	E e	F f	G g	H h
a	be	ce	če	de	e	ef	ge	ha
[a]	[b]	[ts]	[ʧ]	[d]	[e]	[f]	[g]	[x]
I i	J j	K k	L l	M m	N n	O o	P p	R r
i	je	ka	el	em	en	o	pe	er
[i]	[j]	[k]	[l]	[m]	[n]	[o]	[p]	[r]
S s	Š š	T t	U u	V v	Z z	Ž ž		
es	eš	te	u	ve	ze	že		
[s]	[ʃ]	[t]	[u]	[v]	[z]	[ʒ]		

Ž pronounced as J in João

Saint Roch or **Rocco** (lived c. 1348 – 15/16 August 1376/79 (traditionally c. 1295 – 16 August 1327[2])) was a Catholic saint, a confessor whose death is commemorated on 16 August and 9 September in Italy; he is specially invoked against the plague. He may also be called **Rock** in English, and has the designation of St Rollox in Glasgow, Scotland, said to be a corruption of St Roch's Loch, which referred to a small loch once near a chapel dedicated to St. Roch in 1506.[3][4]

He is a patron saint of dogs, falsely accused people, bachelors, and several other things. He is also the patron saint of Casamassima, Cisterna di Latina and Palagiano, Italy.[5]

Saint Roch is given different names in various languages: (Arabic: روكز; Albanian: Shën Rroku; German and Latin: Rochus; Occitan: Ròc; Catalan/Valencian: Roc; Italian: Rocco; French: Roch; Maltese: Rokku; Polish: Roch; Spanish, Filipino and Portuguese: Roque; Slovak: Roch or Rochus; Slovene: Rok; Croatian: Rok or Roko; Icelandic: Rokkus; Hungarian: Rókus; Greek: Ρόκκος; Lithuanian: Rokas).



My research

- strongly correlated electron systems (transport, multiorbital and spin-orbit effects, spin liquids)
- nanodevices (nanowires & superconductors)
- cold-atom systems (solitons in 1D BECs)

http://auger.ijs.si/nano/