HISTORY OF LOGIC IN SERBIA
BELGRADE, 14 – 15 OF JUNE, 2010

ALGEBA AND LOGIC IN MACEDONIA

- A TRIBUTE TO PROFESSOR GORGI ČUPONA (1930 – 2009)

Smile Markovski,

Ss Cyril and Methodius University in Skopje

CHRONOLOGY OF ALGEBRAIC RESEARCHERS

- **1955 – 1959 G. Čupona**
- **1960 – 1972 G. Č. & B. Trpenovski**
- **1973 – 1975 G. Č., B. T. & N. Celakoski**
- **1976 – 1982 G. Č., B. T., N. C. & S. Markovski, P. Kržovski, K. Stojmenovski, S. Kalajdžievski**
- **1983 – 1999 G. Č., B. T., N. C., S. M., P. K., K. S. & D. Dimovski & B. Janeva & K. Trenčevski**
- **2000 –   G. Č., N. C., S. M., D. D., B. J. & M. Hadži-Kosta Josifovska & V. Miovska & D. Korobar-Tanevska & V. Celakoska-Jordanova & A. Sokolova & L. Goračinova Ilieva**

MORE IMPORTANT MACEDONIAN ALGEBRAISTS

D. Dimovski, B. Popov, G. Čupona, S. Markovski, B. Trpenovski

(Missing: N. Celakoski and B. Janeva)

FIELDS OF INTEREST

Binary and *n*-ARY STRUCTURES

An *n*-ary groupoid (G, f) is a set G endowed with an n-ary operation $f: G^n \rightarrow G$

Generalization of properties of binary groupoids (semigroups, quasighroups, ...) to *n*-ary groupoids (*n*-ary semigroups, *n*-ary quasigroups, ...)

FIELDS OF INTEREST

Embedding of *n*-ary structures into binary ones (from some varieties of groupoids)

Hossu-Gluskin type of properties:
Given an *n*-ary group (G, f), there are a binary group $(G, *)$, an authomorphism α on G and a constant $c \in G$ such that

$$f(a_1, ..., a_n) = a_1 * \alpha(a_2) \; ... \; * \alpha(a_n) * c$$

FIELDS OF INTEREST

Embedding of universal algebraic structures into binary ones

Cohn-Rebane type of properties:

Given an algebra (A, F), there is a semigroup S and a family $\{d_f | \ f \in F,$ arity $n(f) > 0\}$ of fixed elements of S, such that for each $f \in F$ and every $a_i \in A$

$$f(a_1, ..., a_{n(f)}) = d_f a_1 \ ... \ a_{n(f)}$$

FIELDS OF INTEREST

Vector-valued structures

An (m,n)-groupoid is a set G endowed with an (m,n)-operation $[\ ]\colon G^m \to G^n$

Definition, structure and properties of (m,n)-semigroups, (m,n)-groups, (m,n)-quasigroups, (m,n)-bands, (m,n)- commutative groupoids, (m,n)-cancellative groupoids, (m,n)-rings, ...

FIELDS OF INTEREST

Embedding of vector-valued structures into binary ones
(from some varieties of groupoids)

Hossu-Gluskin and Cohn-Rebane types of properties

FIELDS OF INTEREST

Free structures in different varieties of algebras

Free Steiner loops, Free Process algebras, …

Free vector-valued structures

Free (m,n)-semigroups, Free (m,n)-groups,…

FIELDS OF INTEREST

Free and injective objects in varieties of groupoids and vector-valued groupoids

(a groupoid $(G, *)$ is injective if the mapping $(x,y) \rightarrow x*y$ is an injection)

Free groupoids with $x^2 x^2 = x^3 x^3$,

Injective vector-valued semigroups,

Canonical groupoids with $x^m y^n = xy,...$

CONFERENCES

The first Yugoslavian conference of algebraists "Algebraic conference" – Skopje, 1980

(Later becoming "Conference of Algebra and Logic")

The first symposium "n-ary Structures" – Skopje 1982

COLABORATIONS

All algebraists from former Yugoslavia

Bulgaria (IMI BAS, Sofia University,
University in Blagoevgrad),

USSR (Moscow University, Kishinev
University

JOINT PAPERS (almost all with algebraists
from Serbia):

J. Ušan, Z. Stojaković, S. Crvenković, G.
Vojvodić, A. Krapež, R. Madarasz, S.
Bogdanović, S. Ilić, P. Protić, R. Tošić

A GREAT FRIENDSHIP

PROF. **SLAVIŠA PREŠIĆ**

&

PROF. **GORGI ČUPONA**

Started in sixties, when Prof. Prešić visited the Library of Math. Inst. in Skopje

Prof. Prešić and his Logic Seminar influenced the development of Mathematical Logic in Macedonia

MATHEMATICAL LOGIC

No fundamental research

Influenced by Prešić seminar

Applications of Model theory in algebraic researches

Seminars and graduate and undergraduate courses, textbooks

- Institute of Informatics – G. Čupona and S. Markovski

- Faculty of Philosophy – J. Josifovski and V. Panzova

QUO VADIS?

Young algebraists? – Two only?

Computer science – Five or six

Abroad universities – Six or seven

THANKS FOR YOUR ATTENTION