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## **DIGITAL LEGACY OF PROFESSOR JOVAN SIMOVLJEVIĆ**

**Abstract.** This paper will present the website Digital Legacy of Jovan Simovljević (1928 – 2007), a distinguished professor at the University of Belgrade. Jovan Simovljević belonged to the narrowest circle of prominent Serbian astronomers. He continued the work of the recognizable Belgrade School of Celestial Mechanics, founded at the beginning of the 20th century by the famous Milutin Milanković. This site is developed as part of the Digital legacies of the Faculty of Mathematics in Belgrade (<http://legati.matf.bg.ac.rs>). This project aims to collect, digitize, and present to the general audience the life and work of the prominent Serbian scientist.

### **1. Introduction**

Information technologies could be successfully utilized to protect our cultural, written and scientific achievements. Digitization project of the Faculty of Mathematics in Belgrade and the Mathematical Institute of the Serbian Academy of Sciences and Arts [1, 2] aimed to accomplish this goal. To preserve our heritage, Virtual Library and Digital Legacies were developed.

Up until now, two digital legacies have been completed for two astronomers: esteemed academician Milutin Milanković [3] and professor Zaharije Brkić. These legacies are publicly available on the Digital Legacy web page of the Faculty of Mathematics: <http://legati.matf.bg.ac.rs>. This paper will present the digital legacy of professor Jovan Simovljević. The site is not entirely finished, but at the time of writing this paper, the collected material includes his books, scientific articles, and photographs. The website of the Digital legacy was created using the WordPress software tool, a free and open-source content management system.

### **2. Short biography of professor Jovan Simovljević (1928-2007)**

Professor Dr Jovan Simovljević (Figure 1, Figure 2) was born on July 26, 1929, in Šid. He studied elementary school in Zemun and Novi Sad and high school in Novi Sad, where he graduated in 1948. In the same year, he enrolled in the astronomical group of the Faculty of Natural Sciences and Mathematics in Belgrade, where he graduated in 1952. He was elected as a teaching assistant at the Department of Mechanics and Astronomy in 1954.



Figure 1. Professor Jovan Lazović

Professor Jovan Simovljević defended his doctoral dissertation "Generalizacija vektorskih elemenata Keplerova kretanja" (Generalization of Vectorial Elements of Kepler's Movement) in 1963 at the University of Belgrade. He was named assistant professor of Theoretical Astronomy at the same Faculty in 1964, associate professor in 1971, and full professor in 1980. He retired in January 1995.

Jovan Simovljević's scientific research was the classical theory of planetary motion, especially planetoids and comets. He had published a significant number of scientific and professional papers and introduced a new subject, Theoretical Astronomy, for 4th-year students. His teaching skill was excellent, and he presented his courses interestingly, systematically, clearly, gradually introducing new concepts.

He wrote the university textbook *Fundamentals of Theoretical Astronomy* interestingly and clearly (Građevinska knjiga, Belgrade, 1977). Generations of astronomers have studied the numerical integration of Kepler's differential equations of motion, the calculation of ephemeris of small bodies and comets, the analysis of the orbits of small bodies and comets and the determination of special perturbations. Professor Simovljević loved his vocation and was devoted to astronomical science. This is evidenced by his numerous scientific and professional papers, which were always independent.

In addition to significant engagement in scientific research and teaching, Professor Simovljević devoted time to other activities. He was a member of the Board, Council and Assembly of the Faculty of Natural Sciences and Mathematics (PMF), a member of the Council of the Department of Mathematical, Mechanical and Astronomical Sciences of the same Faculty, then a member of the Council and a member of the Scientific Council of the Astronomical Observatory in Belgrade. Also, he is one of the founders of the Astronomical Society Ruđer Bošković.



Figure 2. Professor Jovan Simovljević

Besides his vast knowledge of astronomy and mathematics, it is interesting to mention that he possessed a comprehensive understanding of various areas. These areas include history, archaeology, religion, numismatics and other unusual and little known to many people. He was a connoisseur of several foreign and ancient languages, especially ancient Greek and Latin. He was a protector of the Serbian language and the Serbian Cyrillic alphabet.

Professor Simovljević will be remembered as a dear professor who significantly contributed to the development of Serbian astronomy in every possible means. Likewise, generations of his students will reverently preserve the memory of Professor Jovan Simovljević.

He passed away in Belgrade on October 19, 2007.

### 3. Scientific work

The scientific works of Jovan Simovljević (Figure 3) can be divided into three groups. The first group consists of papers dedicated to general issues of the oscillatory elements of planetary motion. Simovljević gave a general way of presenting these elements and their properties, thus eliminating the need to introduce some new elements or parameters, as it had been done earlier. The second group of Simovljević's works refers to various issues of determining the proximity of planetoids. In this field, various works by J. P. Lazović and M. Kuzmanoski influenced him to do so. Simovljević examined in detail the perturbations caused by a small body at a short distance, as well as the possibilities of observing these celestial bodies. The third group consists of works on solar eclipses.

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Ј. Л. СИМОВЉЕВИЋ

ЛОКАЛНИ ПРОКСИМИТЕТИ ПЛАНЕТОИДСКИХ ПУТАЊА  
И ЊИХОВА ПРИМЕНА У РАЧУНУ АПСОЛУТНИХ  
ПРОКСИМИТЕТА

(Придљено на VIII скупу, 26. X 1984. на основу реферата академика Р. Кашанина  
и Т. Анђелића)

Локалним проксимитетом аутор назива положаје два планетоида при њиховој минималној међусобној даљини, ако је при том положај једног тела на његовој путањи унапред задан. Одређује положај другог планетоида у локалном проксимитету са првим и показује како се ова конструкција користи у рачуну апсолутних проксимитета планетоидских путања.

Положаји два планетоида на њиховим елиптичким путањама при најмањој међусобној даљини одређени су, као што је познато, једначинама

$$\left(\frac{\partial \vec{r}_2}{\partial E_1}\right) \vec{p} = 0, \quad \left(\frac{\partial \vec{r}_1}{\partial E_2}\right) \vec{p} = 0, \quad (1)$$

$$\vec{p} = \vec{r}_2 - \vec{r}_1$$

са векторима хелиоцентричних положаја  $\vec{r}_1$  и  $\vec{r}_2$  у функцији ексцентричних аномалија  $E_1$  и  $E_2$  као јединих параметарских променљивих:

$$\vec{r}_i = a_i (\cos E_i - e_i) \vec{P}_i + a_i \sqrt{1 - e_i^2} \sin E_i \vec{Q}_i, \quad (2)$$

$$i = 1, 2.$$

Задатак налажења  $E_1$  и  $E_2$  из система једначина (1) за два планетоида познатих путања, што одређује њихов проксимитет, очигледно није једноставан. Зато постоји више поступака и сви су у суштини поступци узастопних апроксимација. Налажење почетних вредности непознатих  $E_1$  и  $E_2$  представља проблем своје врсте. Прелаз на неке друге променљиве, рецимо праве аномалије, неће суштински поједноставити или скратити рачун у целини.

Figure 3. Front page of Simovljević's article published in journal Glas in 1986.

As for the professional works of Jovan Simovljević, they are mostly intended for the general audience. He wrote articles for the daily press, gave lectures at Kolarac People's University, radio and television.

Furthermore, Jovan Simovljević published the university textbook Fundamentals of Theoretical Astronomy in 1977. This textbook is dedicated to the memory of Professor Vojislav Mišković (1892-1976). It is written on 200 pages and consists of an introduction, five chapters and an Appendix.

#### 4. Digital legacy of professor Jovan Simovljević

Digital Legacy of Jovan Simovljević (Figure 4) is planned to be moved on the main page of Digital Legacies, <http://legati.matf.bg.ac.rs>. The site is built using an open-source content management system, WordPress. WordPress is developed using PHP programming language and MySQL database, and it is extensively used as it is straightforward to use. Moreover, it has a lot of available plugins, widgets, and themes that easily define the website's look and functionality.

Digital Legacy of Jovan Simovljević contains material in different digital formats about his life and scientific work. Materials include professional and scientific papers, books, photos, and detailed biography. In addition, many presented items are commented on and explained. There is also a part containing the writings of other authors on his life and legacy. Available materials are divided into the following groups: doctoral dissertation, scientific papers, books, photographs, and others. In addition, each group has text with further explanations and details.

Digital copies of shown documents are stored in the Virtual Library of the Faculty of Mathematics of the University of Belgrade. Along with each record in the legacy, here is a link to its copy in the Virtual Library.

Most of the presented material has been collected by professor Nadežda Pejović.

## Legat prof. Jovana Simovljevića

*Legat posvećen uspomeni na profesora astronomije Jovana Simovljevića.*

Početna   Biografija   Naučni radovi   Knjige   Članci   O Simovljeviću   Dokumenta   Galerija

### Biografija

Profesor dr Jovan Simovljević je rođen 26. jula 1929. godine u Šidu, od oca Lazara i majke Danice, rođene Kovjanić. Osnovnu školu je učio u Zemunu i Novom Sadu, a gimnaziju u Novom Sadu gde je maturirao 1948. Iste godine se upisao na astronomsku grupu Prirodno-matematičkog fakulteta u Beogradu, gde je diplomirao 1952. godine. Za profesora pripravnika srednje škole postavljen je 1954. i istovremeno dodeljen na rad tadašnjoj Katedri za mehaniku i astronomiju Prirodno-matematičkog fakulteta. Za asistenta za astronomiju izabran je 1956. pri istoj Katedri. Tri meseca tokom 1961/62. godine boravio je u Varšavi na specijalizaciji kod profesora Felicijana Kempinskog. Doktorsku disertaciju Generalizacija vektorskih elemenata Keplerova kretanja odbranio je 1963. na Prirodno-matematičkom fakultetu u Beogradu. U zvanje docenta za predmet Teorijska astronomija izabran je na istom Fakultetu 1964, za vanrednog profesora 1971, a za redovnog profesora 1980. godine. Otišao je u penziju januara 1995. godine.

Naučno-istraživački rad Jovana Simovljevića je iz oblasti klasične teorije planetetskog kretanja, a naročito kretanja planetoida i kometa. Objavio je veliki broj naučnih i stručnih radova. Uveo je nov predmet Teorijsku astronomiju za studente 4. godine, Katedre za Astronomiju Matematičkog fakulteta u Beogradu. Bio je izvrstan pedagog i predavač, izlagao je zanimljivo, sistematski, jasno postepeno uvodeći nove pojmove.



Profesor Jovan Simovljević.

Na interesantan i pregledan način napisao je univerzitetski udžbenik Osnove teorijske astronomije (Građevinska knjiga, Beograd, 1977). Generacije astronoma učile su po ovom udžbeniku

Figure 4. Digital Legacy of professor Jovan Simovljević

## 4. Conclusion

Jovan Simovljević made a meaningful contribution to the development of Serbian astronomy. His achievements were broadly recognized.

To preserve a memory of him and his works, we have developed shown digital legacy, which will be publicly available on <http://legati.matf.bg.ac.rs/>. We believe that this digital legacy will help better understand his life and legacy and the development of Serbian astronomy in the second half of the XX century.

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