

# 4<sup>th</sup> World Congress of MIRCE MECHANICS\*

Woodbury Park, Exeter, United Kingdom, 19 - 21 May 2015

Mirce Operability Equation	09.00	19.05.2015	On Time
Mirce Maintainability Equation	09.00	20.05.2015	On Time
Mirce Supportability Equation	09.00	21.05.2015	On Time

HOUSTON CONTINENTAL 1505 3:15P 6 ON TIME

**MIRCE Akademy**                      **Booking Now**                      **Second Call**

ISLIP NY DELTA 2310 2:55P 96 ON TIME

KANSAS CITY MO SOUTHWEST 109 4:35P 122 ON TIME

LONDON HEATHROW UNITED 918 2:19P 42 BOARDING

LOS ANGELES DELTA 333 3:25P 73 ON TIME

LOS ANGELES SOUTHWEST 143 3:40P 126 ON TIME

LOS ANGELES UNITED 231 4:25P 40 ON TIME

LOUISVILLE DELTA 2409 2:20P 94 ON TIME

MEMPHIS NORTHWEST 961 2:40P 36 CHECK IN

\* MIRCE Mechanics is a scientific theory of the motion of maintainable systems through functionality states in time .



# A personal invitation from Dr Jezdimir Knezevic, Founder & President of the MIRCE Akademy

*Inspired by the work of scientists and equipped with the methods of their studies, during last 40 years I have been focused on systematic and rational studies of the in-service life of transportation, energy, communication, defence, health and similar human created and managed systems. The purpose of research was to create generic knowledge of the in-service behaviour of maintainable systems obtained through observational principles and quantitative reasoning under the name of Mirce Mechanics.*

*To rationally understand motion of functionability through the life of maintainable systems, resulting from atomic, environmental and human actions, I have established the MIRCE Akademy at Woodbury Park in 1999. Staff, Fellows, Members and students of the Akademy have endeavoured to subject phenomena of the motion of functionability to the laws of science and mathematics to:*

- Determine the patterns of the motion of functionability through the life of maintainable systems and to measure functionability properties.*
- Understand mechanisms of the motion of functionability through the life of maintainable systems, within the physical scale from  $10^{-10}$  to  $10^{10}$  metre,*
- Define the scheme for the prediction of functionability trajectory and associated measures of reliability, maintainability, supportability and operability for a given: maintainable system in a given in-service conditions.*

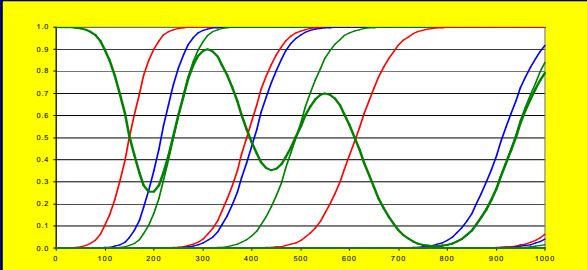
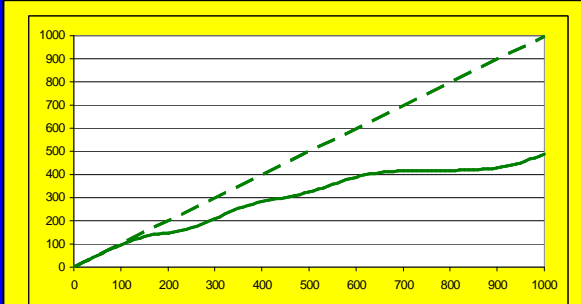
*A generated body of scientific knowledge constitutes Mirce Mechanics whose axioms, formulas, methods and rules enable predictions of the emerging functionability trajectory of the future transportation, communication, navigation and many other maintainable systems to be made*

*However, as Mirce Mechanics is still a young discipline, not all aspects of in-service behaviour of maintainable systems are fully understood. Thus, the main objective of the Congress is to bring together scientists, mathematicians and engineers who are responsible for the design-in performance of machines and operators, maintainers, and logisticians who are responsible for their in-service performance to spend a few days together and learn from each other the complexity of their interactions. The ability to quantify these interactions is essential if the successful trade-off between design-in and in-service performance is to be achieved, as the human “satisfaction of felt needs” for transporting, communicating, defending, entertaining and many other functions depend on it.*

*I do hope that you will realise the significance of the Mirce Mechanics Equations that are to be presented during the Congress and their potential impact on your profession and business as well as a personal enjoyments of being in Devon during the month of May.*

A handwritten signature in black ink, appearing to read 'J. Knezevic'.

## The Congress Programme: Tuesday 19<sup>th</sup> May 2015

<b>0830- 0900</b>	<b>Registration and welcome coffee, Woodbury Park Hotel,</b>	
	<b>Mirce Operability Equation</b>	
<b>0900 -1300</b>  <b>Coffee Break</b> <b>10.30-11.00</b>	<p><i>Scientific principles and concepts expressed through the laws, equations and formulas are the bedrock for the prediction of the deign-in functionality performance of any engineering creation. However, there is no equivalent when the in-service <b>functionability</b> performance predictions have to be made. Hence, Mirce Mechanics has been created at the MIRCE Akademy to fulfil the roll. The main purpose of this presentation is to present the mathematical scheme that fully defined the motion of functionability through the life of maintainable systems, resulting from atomic, environmental or human actions.</i></p>	
		$P(GS @t) = y(t) = \sum_{i=1}^n P(GS' @t)$ $P(GS' <t) + P(GS' @t) + P(GS' >t) = 1 \Rightarrow P(GS' @t) = 1 - P(GS' <t) - P(GS' >t)$ $P(GS' <t) = P(TBE^{mi} \leq t) = B^{mi}(t)$ $P(GS' >t) = P(TGE'_m >t) = 1 - P(TGE'_m \leq t) = 1 - G'_m(t)$ $\Rightarrow P(GS' @t) = 1 - B^{mi}(t) - 1 + G'_m(t) = G'_m(t) - B^{mi}(t)$ $\Rightarrow P(GS @t) = y(t) = \sum_{i=1}^n P[G'_m(t) - B^{mi}(t)] = 1 - \sum_{i=1}^n B^{mi}(t) + \sum_{i=1}^n G'_m(t) = 1 - \beta(t) + \gamma_m(t)$
<b>1300 -1400</b>	<b>Lunch</b>	
<b>14.00-16.30</b>  <b>Tea Break</b> <b>15.15-15.45</b>	<b>Time in Operation</b>  $TIO(t) = \int_0^t y(t) dt$ <p>where:</p> $y(t) = 1 - \beta(t) + \gamma_m(t)$	
<b>1630 -1645</b>	<b>Group Photo for the History of Mirce Mechanics</b>	
<b>1645 -1745</b>	<b>Richard F.W. Bader 2015 Memorial Lecture</b>  <b>Dr J. Knezevic, MIRCE Akademy</b> <b>“I Enjoyed Your Visit Very Much”</b> Last words of Richard Bader to Dr K on 7 <sup>th</sup> April 2010	
<b>1900-2200</b>	<b>Traditional English Fish &amp; Chips in the Traditional English Pub</b> XVII Century English Pub, Topsham (5 miles from Woodbury Park, transport provided)	



### *Richard F.W. Bader*

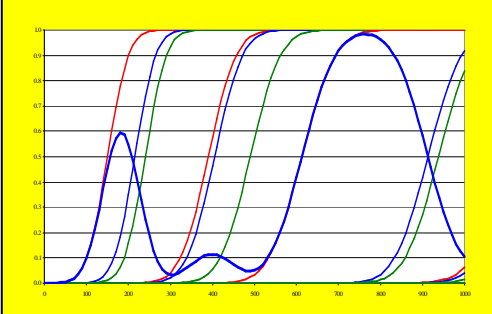
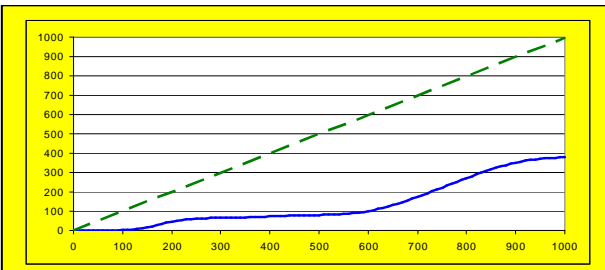
(15 October 1931 – 15 January 2012)

BSc (1953) and MSc (1955) from McMaster University, Ontario, Canada  
 PhD (1958) from the Massachusetts Institute of Technology (MIT). in USA.  
 1966-1996, a full Professor, at McMaster University.  
 1980 Elected a Fellow of the Royal Society of Canada  
 2010 Elected a Grand Fellow of the MIRCE Akademy, UK.

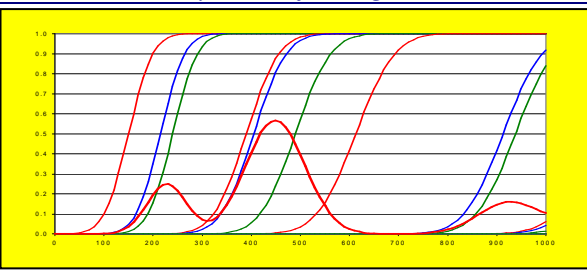
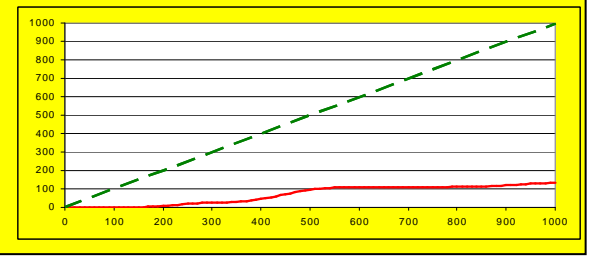
*“The goal of a scientist is to uncover new ideas, concepts and tools, practical or theoretical, that extend our understanding of the world around us and enable us to do new things. In chemistry, the theory of Atoms In Molecules (AIM) developed in my laboratory, is being increasingly used by workers in all fields of chemistry and also in solid state physics. Because AIM has increased our understanding of how atoms behave, it is used in many ways - to develop new alloys and new and better drugs, for example. Nothing pleases me more than the knowledge that each year sees an ever increasing use of AIM by other scientists in the pursuit of their own research.”*

**Thank you Richard for being an inspiration for all of us. Dr K.**

## The Congress Programme: Wednesday 20<sup>th</sup> May 2015

<b>08.30-09.00</b>	<b>Registration and welcome coffee, Woodbury Park Hotel</b>
<b>09.00-13.00</b>	<b>Mirce Supportability Equation</b>
<b>Coffee Break 10.30-11.00</b>	<p><i>The main purpose of this presentation is to present the development of the Mirce Supportability Equation that is the bedrock for Supportability Engineering, Management and Analysis functions for which the prediction of the supportability performance of maintainable systems, for a given support strategies become possible, now.</i></p>
	$\{B,S@t\} = \bigcup_{i=1}^n \{B,S'@t\} \rightarrow P\{B,S@t\} = n_s(t) = \sum_{i=1}^n P\{B,S'@t\}$ $P\{B,S' < t\} + P\{B,S' @t\} + P\{B,S' > t\} = 1$ $\Rightarrow P\{B,S' @t\} = 1 - P\{B,S' < t\} - P\{B,S' > t\}$ $P\{B,S' < t\} = P\{TGE' \leq t\} = G'_s(t)$ $P\{B,S' > t\} = P\{TBE' > t\} = 1 - P\{TBE' \leq t\} = 1 - B'(t)$ $\Rightarrow P\{B,S' @t\} = 1 - G'_s(t) - 1 + B'(t) = B'(t) - G'_s(t)$ $\Rightarrow P\{B,S@t\} = n_s(t) = \sum_{i=1}^n P[B'(t) - G'_s(t)] = \sum_{i=1}^n B'(t) - \sum_{i=1}^n G'_s(t) = \beta(t) - \gamma_s(t)$
<b>13.00-14.00</b>	<b>Lunch Break</b>
<b>14.00-17.00</b>	<b>Time In Support</b>
<b>Coffee Break 15.15-15.45</b>	$TIS(t) = \int_0^t n_s(t) dt$ <p>where:</p> $n_s(t) = \beta(t) - \gamma_s(t)$
	
<b>19.00-22.30</b>	<b>Cherry Reception</b> <b>Gala Dinner – 4<sup>th</sup> Congress of Mirce Mechanics</b> <b>&amp;</b> <b>Presentation: Data Driven Decision Support</b> Chris. Rijdsdijk, Honorary Fellow of the MIRCE Akademy

## The Congress Programme: Thursday 21<sup>st</sup> May 2015

<b>0830- 0900</b>	<b>Registration and welcome coffee, Woodbury Park Hotel,</b>
<b>09.00- 13.00</b>	<b>Mirce Maintainability Equation</b>
<b>Coffee Break 10.30-11.00</b>	<p><i>The main purpose of this presentation is to present the development of the Mirce Supportability Equation that is the bedrock for Maintainability Engineering, Management and Analysis functions for which the prediction of the maintainability performance of maintainable systems, for a given maintenance policies &amp; strategies is possible, now.</i></p>
	$\{B,S@t\} = \bigcup_{i=1}^n \{B,S'@t\} \rightarrow P\{B,S@t\} = n_m(t) = \sum_{i=1}^n P\{B,S'@t\}$ $P\{B,S' < t\} + P\{B,S' @t\} + P\{B,S' > t\} = 1$ $\Rightarrow P\{B,S' @t\} = 1 - P\{B,S' < t\} - P\{B,S' > t\}$ $P\{B,S' < t\} = P\{TGE'_m \leq t\} = G'_{s,m}(t)$ $P\{B,S' > t\} = P\{TGE'_m > t\} = 1 - P\{TGE'_m \leq t\} = 1 - G'_{s,m}(t)$ $\Rightarrow P\{B,S' @t\} = 1 - G'_{s,m}(t) - 1 + G'_{s,m}(t) - G'_{s,m}(t)$ $\Rightarrow P\{B,S@t\} = n_m(t) = \sum_{i=1}^n P[G'_{s,m}(t) - G'_{s,m}(t)] = \sum_{i=1}^n G'_{s,m}(t) - \sum_{i=1}^n G'_{s,m}(t) = \gamma_s(t) - \gamma_m(t)$
<b>1300 -1400</b>	<b>Lunch Break</b>
<b>14.00-17.00</b>	<b>Time in Maintenance</b>
<b>Tea Break 15.15-15.45</b>	$TIM(t) = \int_0^t n_m(t) dt$ <p>where:</p> $n_m(t) = \gamma_s(t) - \gamma_m(t)$
	
<b>17.00-17.15</b>	<b>Closing Remarks and Departure</b>

# Administrative and Financial Information

For the planning purpose, of the participants, exhibitors and presenters, the following Price structure will be applied regarding all services related to the 4<sup>th</sup> World Congress of Mirce Mechanics.

All prices are in GB Pounds	Price	VAT	Total
<b>Participant for 3 Days</b>	645.00	129.00	<b>774.00</b>
<b>Participant per Day</b>	275.00	55.00	<b>330.00</b>
<b>Presenter on the day of presentation</b>	<b>Free</b>		
<b>Presenter for 3 Days</b>	325.00	65.00	<b>390.00</b>
<b>Retired participants for 3 Days</b>	195.00	39.00	<b>234.00</b>
<b>University students for 3 Days</b>	495.00	99.00	<b>594.00</b>
<b>Congress Proceedings on CD</b>	175.00	35.00	<b>210.00</b>
<b>MIRCE Akademy Members</b>	575.00	115.00	<b>690.00</b>
<b>MIRCE Akademy Fellows</b>	595.00	119.00	<b>714.00</b>
<b>MIRCE Akademy Students</b>	525.00	105.00	<b>630.00</b>
<b>Partners Programme for 3 Days</b>	195.00	39.00	<b>234.00</b>
<b>Congress Dinner only</b>	62.50	12.50	<b>75.00</b>
Sherry, 3 course meal & wine			
<b>Exhibitors - Gold Package</b>	6000.00	1200.00	<b>7200.00</b>
<b>Exhibitors - Silver Package</b>	3000.00	600.00	<b>3600.00</b>
<b>Exhibitors - Bronze Package</b>	1500.00	300.00	<b>1800.00</b>
<b>B&amp;B at Woodbury Park Hotel - single</b>	Rooms are		<b>75.00</b>
<b>B&amp;B at Woodbury Park Hotel - double</b>	guaranteed		<b>95.00</b>

## VALUE ADDED TAX (VAT):

Unless special exemption exists, under UK Customs and Excise regulations delegates from all countries are required to pay UK VAT @ 20% on all courses taking place in the UK. Non-UK delegates may be able to recover VAT incurred via the relevant tax authority in the country of origin of the delegate.

## Terms and Conditions

Substitution of participants may be made at any time. If you intend to do this, please advise the MIRCE Akademy ('the organiser') as soon as possible. Cancellation of a booking must be received in writing by the organiser at least 14 days before the commencement of the Congress. The MIRCE Akademy regrets that no refunds or credits will be made after the deadline unless the organiser cancels the Congress. The organiser reserves the right to alter the programme or cancel the Congress at its discretion. All places offered are subject to availability.

## For any other information please contact us:

**Phone;** + 44 (0)1395 233 856,  
**Email:** [quest@mirceakademy.com](mailto:quest@mirceakademy.com)  
**Website:** [www.mirceakademy.com](http://www.mirceakademy.com)



## About the Venue

Woodbury Park is a magnificent 500 acre complex set among rolling hills above the South West English coastline, only a few miles from Exeter.

Communication between Exeter and other parts of the United Kingdom are excellent. **By road**, the M5 motorway links Exeter to London, the Midlands, Scotland and Wales. Regular rapid coaches run services to and from London and Heathrow Airport. **By rail**, a regular fast service is available to and from Exeter (St David's Station) and London (Paddington Station). **By air**, Exeter Airport offers regular flights to many British and Continental destinations and is situated near to Woodbury Park.

Travel between Exeter and Woodbury normally requires a car or taxi.

Among the outstanding leisure facilities at Woodbury Park are two golf courses including the magnificent **Oaks Championship course**, tennis courts, a swimming pool, spa, sauna and fully equipped gymnasium and well appointed lounge areas and bars.

**Woodbury Park, Exeter, EX5 1JJ, UK**

☎ +44 (0) 1395 233 382

☎ +44 (0) 1395 233 384

✉ [enquiries@woodburypark.co.uk](mailto:enquiries@woodburypark.co.uk)

🌐 [www.woodburypark.co.uk](http://www.woodburypark.co.uk)



**Exeter** is the most southwesterly Roman fortified settlement in Britain. Exeter Cathedral was founded in the early 12th century and has several notable features, including an early set of misericord, an astronomical clock and the longest uninterrupted vaulted ceiling in England. **Today**, Exeter is identified as one of the top ten most profitable locations for a business to be based.



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**Woodbury Park Hotel & Golf Club, Exeter, EX5 1JJ, UK – home of the MIRCE Akademy**

# 4<sup>th</sup> World Congress of Mirce Mechanics 19 – 21 May 2015

## BOOKING FORM

Email: [quest@mirceakademy.com](mailto:quest@mirceakademy.com)

Phone: +44 (0) 1395 233 856

Mail: MIRCE Akademy, Woodbury Park, Woodbury, Exeter, EX5 1JJ, United Kingdom

Web site: [www.mirceakademy.com](http://www.mirceakademy.com)

THIS FORM MAY BE COPIED

Please select appropriate level of service and corresponding fee.

Group discounts are available please contact us.

### The Symposium Fees includes:

- Attendance
- Congress Papers and Supporting Materials
- Lunches and Light Refreshments
- Gala Dinner on 20<sup>th</sup> May
- Richard Bader Memorial Lecture
- Fish & Chips Event on 19<sup>th</sup> May

### Value Added Tax (VAT)

Unless special exemption exists, under UK Customs and Excise regulations delegates from all countries are required to pay UK VAT @ 20 % on all courses taking place in the UK. Non-UK delegates may be able to recover VAT incurred via the relevant tax authority in the country of origin of the delegate.

### PAYMENT DETAILS

Please invoice my organisation (**Note: UK MOD personnel can pay by BACS through the DBA – Contractor Number will be supplied with invoice**)

For the attention of \_\_\_\_\_

Purchase Order No. \_\_\_\_\_

Please Charge credit card £ \_\_\_\_\_

Visa                      MasterCard                      Amex

Cardholder \_\_\_\_\_

Card No. \_\_\_\_\_

Expiry Date \_\_\_\_\_ Security Number \_\_\_\_\_

Signature \_\_\_\_\_

### PERSONAL DETAILS (Please print clearly)

Surname \_\_\_\_\_

First name \_\_\_\_\_

Organisation \_\_\_\_\_

Department \_\_\_\_\_

Position \_\_\_\_\_

Address \_\_\_\_\_

Postcode \_\_\_\_\_ Country \_\_\_\_\_

Tel \_\_\_\_\_ Fax \_\_\_\_\_

E-mail \_\_\_\_\_

Special requirements                      Yes                      No

Please specify

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I understand and accept the registration terms and conditions as shown

Signature \_\_\_\_\_ Date \_\_\_\_\_

### Terms and Conditions

Substitution of participants may be made at any time. If you intend to do this, please advise the MIRCE Science ('the organiser') as soon as possible. Cancellation of a booking must be received in writing by the organiser at least 14 days before the commencement of the Symposium. MIRCE Science regrets that no refunds or credits will be made after the deadline unless the organiser cancels the Event.

The organiser reserves the right to alter the programme or cancel the Summer School at its discretion. All places offered are subject to availability.