



4.2. Design-ul posterelor științifice

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Universitatea Babeș-Bolyai, Cluj-Napoca



Proiect finanțat de
UNIUNEA EUROPEANĂ



MINISTERUL MUNCII
FAMILIEI ȘI PROTECȚIEI SOCIALE
AMPOSDRU



FONDUL SOCIAL EUROPEAN
POS DRU
2007-2013



INSTRUMENTE STRUCTURALE
2007-2013



MINISTERUL EDUCAȚIEI
CERCETĂRII ȘI INOVĂRII
OIPOSDRU



UNITATEA EXECUTIVĂ PENTRU
FINANȚAREA ÎNVĂȚĂMÂNTULUI
SUPERIOR ȘI A CERCETĂRII
ȘTIINȚIFICE UNIVERSITARE



Material adaptat după:

Purrington, C.B. 2009. Advice on designing scientific posters,
<http://www.swarthmore.edu/NatSci/cpurrrin1/posteradvice.htm>



Conceptul de poster

Un poster științific este un **document** de dimensiuni mari, care poate fi **expus** și cu ajutorul căruia pot fi comunicate sintetic rezultatele unei cercetări științifice (la un simpozion științific etc.)

Un poster se compune din:

- **titlu** (scurt și sugestiv)
- **introducere** asupra domeniului de interes
- **prezentare sintetică** a abordării experimentale / teoretice
- **discuție a rezultatelor** celor mai semnificative
- enumerare a **referințelor bibliografice** relevante
- menționare a **surselor de finanțare** de care a beneficiat cercetarea.

Conceput corect, un poster poate fi parcurs integral în **10 minute**.



Avantajele prezentării poster

Chiar dacă tot conținutul poate fi prezentat într-o prelegere de 15 minute la o conferință, un poster ca atare are o serie de avantaje:

- permite o **interacțiune mai personală** cu cei interesați
- la cerere poate fi **suplimentat verbal cu detalii tehnice**, care pot să nu fie de interes general
- permite și **atragera unui auditoriu** din afara domeniului lucrării
- poate fi consultat și în **absența autorului**
- poate fi **reutilizat** și la alte manifestări științifice
- poate fi **expus** în departament și atestă cercetarea desfășurată.
- reprezintă un **exercițiu pregătitor** foarte util pentru viitoarea etapă profesională – cea a “prezentărilor orale”.



Când este preferabilă prezentarea poster?

Prezentarea poster este preferabilă pentru:

- persoane **fără elocvență** necesară prezentărilor orale plenare
- **cercetători tineri** sau **studenți** care nu se bucură încă de notorietate în comunitatea științifică, aflați în perioada de afirmare.



Condiții tipice în care are loc prezentarea

Cel mai adesea, circumstanțele în care este prezentat un poster sunt **dificile** și chiar **imprevizibile**.

În general, sesiunea se desfășoară într-o **sală aglomerată**; participanții socializează în jurul panourilor sau chiar consumă gustări și băuturi.

Pentru **a atrage și a fi „ales”**, făcând față concurenței panourilor învecinate, posterul trebuie să iasă în evidență prin:

- **concepție grafică atractivă**
- **conținut științific penetrant.**



Alegerea aplicației grafice

Cele mai performante și bine adaptate aplicații pentru proiectarea posterelor în format mare sunt [QuarkXPress](#) și [InDesign](#).

Se pot realiza postere mari și folosind pachete grafice nespecializate, cum ar fi [CorelDRAW](#), [Adobe Illustrator](#) și [PowerPoint](#).

Fișiere model pentru multe dintre acestea pot fi găsite pe internet.

Aplicații gratuite cu care pot fi realizate postere pot fi găsite la www.postersw.com.



Alegerea aplicației grafice

Cea mai atractivă soluție pare a fi **Powerpoint**, omniprezentă în pachetul Microsoft Office.

În pofida aparentei versatilități:

- **dimensiunea documentelor** este limitată (56" sau 142 cm)
- **controlul culorilor** nu este foarte bun
- **rezoluția** la care pot fi tipărite documentele este sub cea necesară formatelor mari
- **formatul fișerelor** PowerPoint nu este suportat în unele tipografii datorită limitărilor aplicației.



Alegerea aplicației grafice

O opțiune mai adecvată, chiar dacă prin complexitatea opțiunilor este mai greu de învățat și utilizat, este **CoreIDRAW**.

Alături de Adobe Illustrator și InDesign, CoreDRAW face parte din categoria aplicațiilor „**what you see is what you get**”.



Layout-ul

Înainte de a începe elaborarea posterului, trebuie obținute **specificațiile privind formatul posterului** prin consultarea paginii web (a organizatorilor) manifestării științifice.

Nu trebuie epuizat întregul spațiu pus la dispoziție – posterul nu trebuie să fie mai mare decât este necesar pentru a cuprinde informația esențială.

Materialul trebuie **rescris** față de modul în care ar fi inclus într-un articol.

Formulările trebuie **simplificate**, fiind acceptabile **exprimări eliptice**.

Aspectul general trebuie adaptat la **numărul, forma și cromatica elementelor grafice** pe care le va cuprinde posterul.



Layout-ul

Posterul va comunica optim conținutul științific al lucrării dacă:

- ponderea textului și a elementelor grafice este adecvată
- este menținut suficient spațiu alb în jurul blocurilor
- se păstrează o aliniere logică a coloanelor.

Practică bună: păstrarea numărului de cuvinte la un nivel cât mai scăzut – **800 de cuvinte sau mai puțin** – maximizează șansele ca posterul să fie parcurs în întregime.

Este utilă consultarea unor galerii de postere:

- http://groups.ucanr.org/posters/Templates_for_Posters/
- http://www.makesigns.com/SciPosters_Templates.aspx
- <http://miu.med.unsw.edu.au/welcome.htm>



University of California: Posters and Slides

<http://groups.ucanr.org/posters/Templates for Posters/>

Put your Title here

Author's Name/s Goes Here, Author's Name/s Goes Here, Author's Name/s Goes Here
Address/es Goes Here, Address/es Goes Here, Address/es Goes Here

Introduction
First...
Check with conference organizers on their specifications of size and orientation, before you start your poster; eg. maximum poster size: landscape, portrait or square.
The page size of this poster template is 43" x 36" landscape (horizontal) format. Do not change this page size. ANRCS can scale-to-fit a smaller or larger size, when printing. If you need a different shape start with either a portrait (vertical) or a square poster template.
Bear in mind you do not need to fill up the whole space allocated by some conference organizers (eg. 80x4ft in the USA). Do not make your poster bigger than necessary, just to fill that given size.

Method
Tips for making a successful poster...
• Re-write your paper into poster format i.e. Simplify everything, avoid data overkill.
• Headings of more than 6 words should be in upper and lower case, not all capitals.
• Never do whole sentences in capitals or underline to stress your point, use bold characters instead.
• When laying out your poster leave breathing space around your text. Don't overcrowd your poster.
• Try using photographs or colored graphs. Avoid long numerical tables.
• Spell check and get someone else to proof-read.

Results
Importing / inserting files...
Images such as photographs, graphs, diagrams, logos, etc. can be added to the poster.
To insert scanned images into your poster, go through the menus as follows: Insert / Picture / From File... then find the file on your computer, select it, and press OK.
The best type of image files to insert are JPEG or TIFF. JPEG is the preferred format.
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Notes about graphs...
For simple graphs use MS Excel, or do the graph directly in PowerPoint.
Graphs done in a scientific graphing programs (eg. Sigma Plot, Prism, SPSS, Statistec) should be saved as JPEG or TIFF, if possible.

Printing
Note: Do not leave your poster until the last minute. Allow at least 6 working days before you need to use it. ANR staff not located on the Davis campus must estimate additional shipping time back to your office or destination. Free Standard UPS shipping is used unless the client requests FedEx service. If FedEx is requested, the client will be charged for the shipping rate.
Once you have completed your poster, bring or send it to ANRCS for printing.
Location: 1441 Research Park, Davis, CA
Web Upload site: <http://anrcs.ucdavis.edu>

Simply highlight the text and replace.

Cost...
For poster-printing charges contact ANRCS

Conclusion
For more information on:
Poster Design, Scanning and Digital Photography, and Image / File size.

Contact:
ANR Communication Services
University of California, Davis, CA95616
Ph: 530-757-8992
Email: ckfukushima@ucdavis.edu
Web: <http://anrcs.ucdavis.edu>

Acknowledgements
This poster template was created by the Medical Illustration Unit, Prince of Wales Hospital, University of New South Wales, Sydney, Australia and edited for our use.

Aim
How to use this poster template...
Simply highlight this text and replace it by typing in your own text, or copy and paste your text from a MS Word document or a PowerPoint slide presentation.
The body text / font size should be between 24 and 32 points. Arial, Helvetica or equivalent.
Keep body text left-aligned, do not justify text.
The color of the text, title and poster background can be changed to the color of your choice.

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University of California, Davis, CA 95616
Ph: 530-757-3352
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The Medical Illustration Unit

UNSW Faculty of Medicine and Teaching Hospitals

<http://miu.med.unsw.edu.au/welcome.htm>



Poster title goes here, containing strictly only the essential number of words...



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Introduction

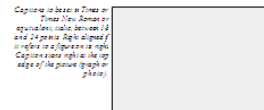
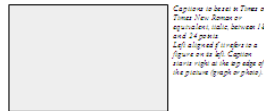
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Bear in mind you do not need to fill up the whole space allocated by some conference organisers (eg. 8ftx4ft in the USA). Do not make your poster bigger than necessary just to fill that given size.

Aim

How to use this poster template...
Simply highlight this text and replace it by typing in your own text, or copy and paste your text from a MS Word document or a PowerPoint slide presentation.
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Printing and Laminating...
Once you have completed your poster, bring it down to MIU for printing. We will produce a A3 size draft print for you to check and proof read. The final poster will then be printed and laminated.
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Cost...
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Conclusion

For more information on: Poster Design, Scanning and Digital Photography, and Image / file size.

Contact:
Medical Illustration Unit
Prince of Wales Hospital
Ph: 9392 2800
Email: miu@unsw.edu.au
Web: <http://miu.med.unsw.edu.au>

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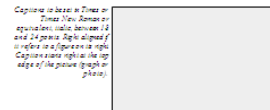
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Conclusion

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Prince of Wales Hospital
Ph: 9382 2800
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Web: <http://miu.med.unsw.edu.au>

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Author's Name/s Goes Here, Author's Name/s Goes Here
Address/es Goes Here, Address/es Goes Here

Introduction

Check with conference organizers on their specifications of size and orientation, before you start your poster. All dimensions should use metric units, centimeters or millimeters.

The page size of the poster depends on the conference. Some are 100cm wide by 150cm high, others are 120cm wide by 180cm high. You can choose to print a smaller or larger size than printing. If you need a smaller size, you can print a smaller, horizontal, or a square poster format.

Check if there you do not need to fit on the poster space allocated by some conference organizers (eg. 100cm x 150cm). Do not make your poster bigger than necessary. Use 10% to the given size.

Aim

Post to use the poster format.

Simply highlight the text and replace it by typing in your own text or copy and paste your text from a US Word document or a PowerPoint slide presentation.

The body text font size should be between 24 and 32 points. Any font smaller or smaller.

Headings are highlighted, do not underlines.

The colour of the text and the poster background can be changed to the colour of your choice.

Method

For making a successful poster:

- Double your poster into poster format or simply enlarge, avoid data down.
- Headings of more than 8 lines should be in bold and clear text, not all letters.
- Lower to three sentences in order of importance to stress your point. Use bold characters instead.
- When using your poster, make sure the text is clear and legible. Don't overuse your space.
- To use photographs or scanned photos. Also use graphics, tables.
- Some check and get someone else to proofread.

Results

Highlight, meaning line... images such as photographs, graphs, diagrams, logos, etc. can be added to the poster.

To insert scanned images into your poster, go through the menu as follows: Insert > Picture > From File > then find the file on your computer, select it, and press OK.

The best type of image files to insert are JPEG or TIFF. JPEG is the preferred format.

Be aware of the image size you are inserting. The average poster image (24 x 36cm at 300dpi) should be about 200 x 200 pixels for 300 pixels/cm. Do not use a larger image.

Do not use images from the web.

Conclusion

For more information on Poster Design, Spelling and Date, Photography, and Image of the poster.

Contact:
Medical Illustration Unit
Room of Medical Illustration
Ph: 2552 2000
Email: miu@miu.med.unsw.edu.au
Web: <http://miu.med.unsw.edu.au>

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Just highlight the text and replace with your own text. Replace the text with your text.

Title Goes Here Title Goes Here Title Goes Here
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Efficient electrolyte modeling in MD simulations of bulk liquids, interfaces and ion channels



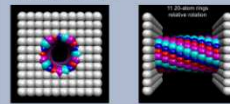
Titus A. Beu

Ion channels

- Proteins that control the passage of ions across membranes.
- Functions:
 - generation of action potentials in nerves and muscles
 - regulation of hormone release from endocrine cells etc.
- High selectivity for particular ion types (Na⁺, K⁺, Ca²⁺, Cl⁻).
- High transport rates (~10⁷ ions per second).
- Highly inhomogeneous electrolyte – challenging aspect.

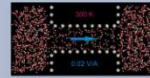
Model membrane channel

- P. S. Crozier et al. Phys. Rev. Lett. **86**, 2487 (2001).
- Length = 25 Å, diameter = 10.625 Å, atom distance = 2.5 Å
- Nonpolar membrane (similar to ricinoleic acidylcholine)
- 388 sites: charges (-0.5e, -0.35e, +0.35e, +0.5e, neutral) + Lennard-Jones interactions.



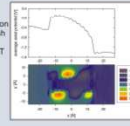
Simulation cell

- Electrolyte – 1M NaCl solution: 600 H₂O, 8 Na⁺ and 8 Cl⁻
- Periodic boundary conditions in all three directions.
- Simulation cell: 25 Å x 25 Å x 50 Å



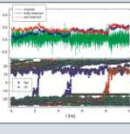
Potential

Solution of Poisson's equation for ensemble-averaged mesh-based charge distribution in reciprocal space – using FFT



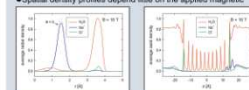
Ion passages

- Increased water polarization followed by relaxation
- Polarization angle θ between the water dipole and the channel axis
- Polarization in the channel: large fluctuations, quick relaxation, reversed sign after ion passage



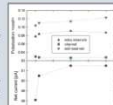
Average density distributions

- Structured channel – H₂O molecules form boundary layers
- Spatial density profiles depend little on the applied magnetic field



Net current

- Magnetic fields:
 - cause a slight increase of the ion current (up to 10%), not a decrease, as intuitively expected
 - enhance ion transport indirectly by enhancing water polarization, especially in the reservoirs.



Rotation of rigid molecules - Quaternions

$$q_0 = \cos(\theta/2) \cos(\phi/2) \\ q_1 = \sin(\theta/2) \cos(\phi/2) \\ q_2 = \sin(\theta/2) \sin(\phi/2) \\ q_3 = \cos(\theta/2) \sin(\phi/2)$$

Equations of motion for quaternions

$$\begin{pmatrix} \dot{q}_0 \\ \dot{q}_1 \\ \dot{q}_2 \\ \dot{q}_3 \end{pmatrix} = -2W \begin{pmatrix} q_1 \\ q_2 \\ q_3 \\ q_0 \end{pmatrix}, \quad W = \begin{pmatrix} \omega_x & \omega_y & \omega_z & 0 \\ -\omega_x & \omega_y & 0 & \omega_z \\ \omega_x & 0 & \omega_y & -\omega_z \\ 0 & \omega_x & \omega_y & \omega_z \end{pmatrix}$$

Angular velocities:

$$\begin{pmatrix} \omega_x \\ \omega_y \\ \omega_z \end{pmatrix} = \frac{1}{2} \begin{pmatrix} 4\dot{q}_0 - \dot{q}_1^2 - \dot{q}_2^2 - \dot{q}_3^2 \\ 2(\dot{q}_1 q_2 - \dot{q}_2 q_1) \\ 2(\dot{q}_2 q_3 - \dot{q}_3 q_2) \\ 2(\dot{q}_3 q_0 - \dot{q}_0 q_3) \end{pmatrix}$$

Ewald sum

Coulomb interactions with distant images cannot be neglected – minimum image criterion cannot be applied.

$$E = \frac{1}{2} \sum_i \sum_j \frac{q_i q_j}{|r_{ij}|} \\ \text{Real space Ewald sum – direct summation is impracticable.} \\ \text{Reciprocal space contribution:} \\ E^{(R)} = \frac{1}{2} \sum_i \sum_j \frac{q_i q_j}{|r_{ij}|} \quad E^{(C)} = -\frac{1}{2} \sum_i \sum_j \frac{q_i q_j}{|r_{ij}|}$$

Reciprocal space contribution:

$$E^{(R)} = \frac{1}{2} \sum_i \sum_j \frac{q_i q_j}{|r_{ij}|} \quad E^{(C)} = -\frac{1}{2} \sum_i \sum_j \frac{q_i q_j}{|r_{ij}|}$$

Real space forces – interaction of smeared charges:

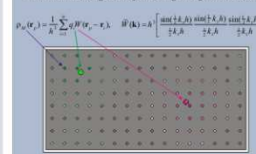
$$F_i^{(R)} = q_i \sum_j \frac{q_j}{|r_{ij}|^3} \frac{r_{ij}}{|r_{ij}|} \quad F_i^{(C)} = -q_i \sum_j \frac{q_j}{|r_{ij}|^3} \frac{r_{ij}}{|r_{ij}|}$$

Reciprocal space contribution – interaction of point and smeared:

$$F_i^{(R)} = q_i \sum_j \frac{q_j}{|r_{ij}|^3} \frac{r_{ij}}{|r_{ij}|} \quad F_i^{(C)} = -q_i \sum_j \frac{q_j}{|r_{ij}|^3} \frac{r_{ij}}{|r_{ij}|}$$

P'M FFT-accelerated Ewald sum

- M. Deserno and C. Holm, J. Chem. Phys. **109**, 7678 (1998); J. Chem. Phys. **109**, 7034 (1998).
- Mesh-based charge density and charge assignment function



Optimal influence function – computed only once:

$$G_{\text{opt}}(\mathbf{k}) = \frac{1}{2} \left[\frac{1}{k} \left(1 + \frac{2\alpha}{k} \right) \right] \left[\frac{1}{k} \left(1 + \frac{2\alpha}{k} \right) \right] \quad \tilde{G}_{\text{opt}}(\mathbf{k}) = \frac{1}{2} \left[\frac{1}{k} \left(1 + \frac{2\alpha}{k} \right) \right] \left[\frac{1}{k} \left(1 + \frac{2\alpha}{k} \right) \right]$$

Mesh-based electrostatic field:

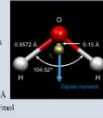
$$\Phi^{\text{opt}}(\mathbf{r}_i) = \text{FFT}[\tilde{G}_{\text{opt}}(\mathbf{k}) \cdot \tilde{\rho}(\mathbf{k})]_{\mathbf{k}=\mathbf{r}_i} \quad E^{\text{opt}}(\mathbf{r}_i) = \text{FFT}[\tilde{G}_{\text{opt}}(\mathbf{k}) \cdot \tilde{\rho}(\mathbf{k}) \cdot i\mathbf{k}]_{\mathbf{k}=\mathbf{r}_i}$$

Reciprocal-space contributions to the energy and forces:

$$E^{(R)} = \frac{1}{2} \sum_i \sum_j \frac{q_i q_j}{|r_{ij}|} \quad E^{(C)} = -\frac{1}{2} \sum_i \sum_j \frac{q_i q_j}{|r_{ij}|}$$

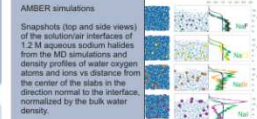
TIP4P model potential for H₂O

- W.L. Jorgensen et al., Chem. Phys. **78**, 520 (1983).
- 4 interaction sites: O, H atoms + site S (lone-pair e)
- Electrostatic charges on H atoms and on the site S ($q_H = 0.52q$)
- Lennard-Jones interactions only between O atoms



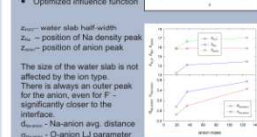
Ion effects of the air/water interface

P. Jungwirth & D.J. Tobias, Chem. Rev. **104**, 1259-1281 (2006)

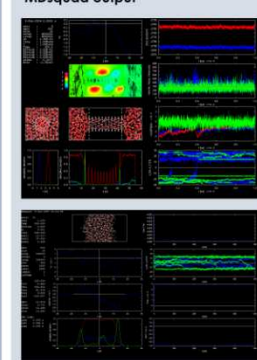


The P'M toolbox

- Residues – rigid bodies with interaction sites
- Eliminates internal degrees of freedom
- No need for "shake"
- P'M FFT-accelerated method of Hookway & Eastwood
- Optimized split-space param.
- Mesh-based electrostatics
- Optimized influence function



MSDquad output



Poster realizat in format A0 (84 x 119 cm) cu ajutorul aplicației CorelDRAW.



Secțiunile unui poster și conținutul lor

Titlul

Trebuie să transmită **sintetic și atractiv problema** tratată și **modul de abordare**. Forța de impact a titlului este primul element care atrage public.

Lungimea nu trebuie să depășească **două linii**.

Fontul utilizat trebuie să fie relativ mare (**72-80 pt**) și de preferință **bold**.



Efficient electrolyte modeling in MD simulations
of bulk liquids, interfaces and ion channels

Titus A. Beu





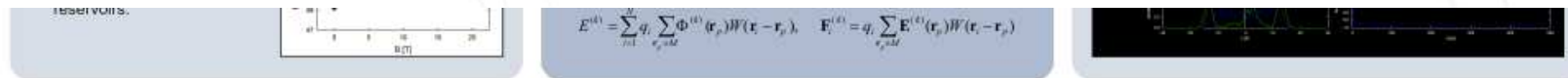
Secțiunile unui poster și conținutul lor

Autori și afiliere

Imediat sub titlu trebuie indicați autorii și afilierea lor, eventual cu ajutorul **siglelor instituțiilor**, mai ales dacă acestea au valențe estetice.

Mărimea fontului utilizat este bine să fie aproximativ **2/3** din cea pentru titlu (de exemplu, **48 pt**).

O altă variantă de poziționare a afilierii este în subsolul posterului.



University "Babes-Bolyai"
Department of Theoretical and
Computational Physics
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400084 Cluj-Napoca,
Romania
Tel: +40 264 405300
Fax: +40 264 591906



Secțiunile unui poster și conținutul lor

Rezumat?

Nu trebuie inclus un rezumat!

Dacă posterul este prezentat la o sesiune, autorii vor fi probabil invitați să furnizeze un rezumat pentru a fi **inclus în broșura conferinței**.

Este posibil ca alegerea posterului să fie făcută tocmai în urma consultării rezumatului din broșura conferinței.



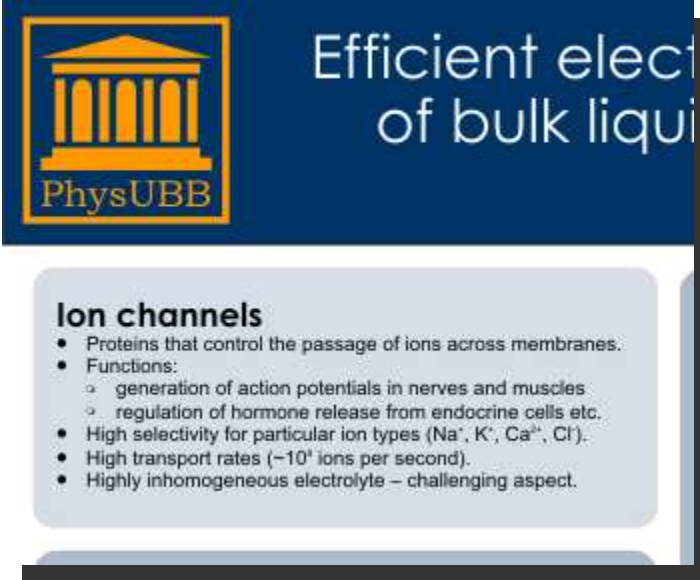
Secțiunile unui poster și conținutul lor

Introducere

Nu trebuie să poarte neapărat acest subtitlu, fiind menită să capteze atenția imediat după titlu.

Utilizând un **minim de informații și definiții**, trebuie să **plaseze rapid problema** în contextul general, să furnizeze o indicație succintă și o justificare asupra abordării utilizate.

Introducerea poate include 1-2 **imagini cu impact vizual**.



The poster features a dark blue header with the PhysUBB logo (a yellow building icon) on the left and the title "Efficient elect of bulk liqui" in white text on the right. Below the header is a light blue box containing the text "Ion channels" and a bulleted list of points.

PhysUBB

Efficient elect
of bulk liqui

Ion channels

- Proteins that control the passage of ions across membranes.
- Functions:
 - generation of action potentials in nerves and muscles
 - regulation of hormone release from endocrine cells etc.
- High selectivity for particular ion types (Na⁺, K⁺, Ca²⁺, Cl⁻).
- High transport rates (~10⁸ ions per second).
- Highly inhomogeneous electrolyte – challenging aspect.



Secțiunile unui poster și conținutul lor

Introducere

Justificarea că tema sau metodologia nu a mai fost abordată anterior **nu este convingătoare.**

Mărimea fontului pentru titlurile secțiunilor poate fi aproximativ **1/2** din cea a titlului (**36 pt**), iar cea pentru textul secțiunilor, **1/3 (24 pt)**.

Nu trebuie să depășească **200 de cuvinte**.

**Efficient elect
of bulk liqui**

PhysUBB

Ion channels

- Proteins that control the passage of ions across membranes.
- Functions:
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- Highly inhomogeneous electrolyte – challenging aspect.



Secțiunile unui poster și conținutul lor

Materiale și metode

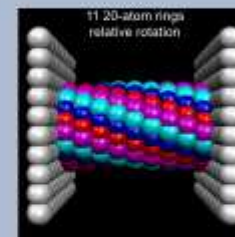
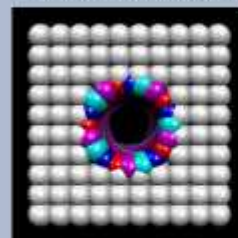
Secțiune menită să ofere o **imagine sintetică asupra echipamentelor** (experimentale și/sau de calcul) și a **metodelor** utilizate.

Diagrame prezentând intercorelarea logică a diferitelor componente sau etape, sunt binevenite.

Fotografii pot să ofere informații subliminale asupra anvergurii și importanței cercetării întreprinse.

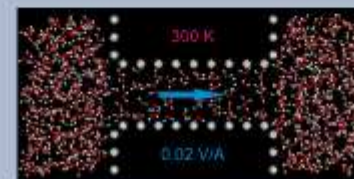
Model membrane channel

- P. S. Crozier et al., Phys. Rev. Lett. **86**, 2467 (2001).
- Length = 25 Å, diameter = 10.625 Å, atom distance = 2.5 Å
- Non-polar membrane (similar to nicotine acetylcholine)
- 388 sites: charges (-0.5e, -0.35e, +0.35e, +0.6e, neutral) + Lennard-Jones interactions



Simulation cell

- Electrolyte – 1M NaCl solution: 600 H₂O, 8 Na⁺ and 8 Cl⁻
- Periodic boundary conditions in all three directions.
- Simulation cell: 25 Å x 25 Å x 55 Å





Secțiunile unui poster și conținutul lor

Materiale și metode

În cazul lucrărilor teoretice, poate fi sintetizată **formularea matematică** sau prezentate succint **modele și algoritmi numerici**.

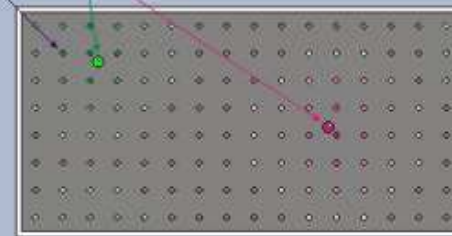
Subtitlurile și propozițiile nu trebuie formate exclusiv cu **majuscule** sau cu **caractere subliniate**.

Se pot folosi în schimb caractere **italic** sau **bold**.

P³M FFT-accelerated Ewald sum

- M. Deserno and C. Holm, J. Chem. Phys. **109**, 7678 (1998); J. Chem. Phys. **109**, 7694 (1998).
- Mesh-based charge density and charge assignment function

$$\rho_M(\mathbf{r}_p) = \frac{1}{h^3} \sum_{\mathbf{m}} q W(\mathbf{r}_p - \mathbf{r}_m), \quad \tilde{W}(\mathbf{k}) = h^3 \left[\frac{\sin(\frac{1}{2}k_x h)}{\frac{1}{2}k_x h} \frac{\sin(\frac{1}{2}k_y h)}{\frac{1}{2}k_y h} \frac{\sin(\frac{1}{2}k_z h)}{\frac{1}{2}k_z h} \right]^2$$



Optimal influence function – computed only once:

$$G_{opt}(\mathbf{k}) = \frac{i\mathbf{k} \cdot \sum_{\mathbf{m}} \left(\frac{1}{h^3} \tilde{W}\left(\mathbf{k} + \frac{2\pi}{h}\mathbf{m}\right) \right)^2 \tilde{\mathbf{R}}\left(\mathbf{k} + \frac{2\pi}{h}\mathbf{m}\right)}{k^2 \left[\sum_{\mathbf{m}} \left(\frac{1}{h^3} \tilde{W}\left(\mathbf{k} + \frac{2\pi}{h}\mathbf{m}\right) \right)^2 \right]}, \quad \tilde{\mathbf{R}}(\mathbf{k}) = -i\mathbf{k} \frac{4\pi}{k^2} e^{-k^2 \epsilon_0 \epsilon^2}$$

Mesh-based electrostatic field:

$$\Phi^{(1)}(\mathbf{r}_p) = \text{FFT}[\tilde{\rho}_M(\mathbf{k}) \times G_{opt}(\mathbf{k})]_{\mathbf{r}_p}, \quad \mathbf{E}^{(1)}(\mathbf{r}_p) = \text{FFT}[-i\mathbf{k} \times \tilde{\rho}_M(\mathbf{k}) \times G_{opt}(\mathbf{k})]_{\mathbf{r}_p}$$

Reciprocal-space contributions to the energy and forces:

$$E^{(1)} = \sum_{\mathbf{m}} q_i \sum_{\mathbf{m}' \neq \mathbf{m}} \Phi^{(1)}(\mathbf{r}_p) W(\mathbf{r}_p - \mathbf{r}_{\mathbf{m}'}), \quad \mathbf{F}_i^{(1)} = q_i \sum_{\mathbf{m}' \neq \mathbf{m}} \mathbf{E}^{(1)}(\mathbf{r}_p) W(\mathbf{r}_p - \mathbf{r}_{\mathbf{m}'})$$



Secțiunile unui poster și conținutul lor

Materiale și metode

Trebuie păstrat suficient spațiu alb (nețru) în jurul blocurilor de informație, astfel încât posterul să nu dea impresia de aglomerare.

Această secțiune trebuie limitată la cel mult **200 de cuvinte**.

TIP4P model potential for H₂O

- W.L. Jorgensen et al., Chem. Phys. **79**, 926 (1983).
- 4 interaction sites: O, H atoms + site S (lone-pair e⁻)
- Electrostatic charges on H atoms and on the site S ($q_H = 0.52e$)
- Lennard-Jones interactions only between O atoms



$$u_{ij} = 4\epsilon \left[\left(\frac{\sigma}{r_{ij}} \right)^{12} - \left(\frac{\sigma}{r_{ij}} \right)^6 \right], \quad \sigma = 3.1536 \text{ \AA}$$
$$\epsilon = 0.6487 \text{ kJ/mol}$$



Secțiunile unui poster și conținutul lor

Rezultate

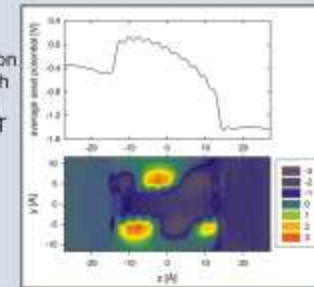
Este de obicei secțiunea cea mai consistentă și trebuie să poată furniza de sine stătătoare informația esențială asupra cercetării.

Imaginile și graficele transmit mai multă informație decât textul !!!

Sunt de evitat tabele numerice extinse.

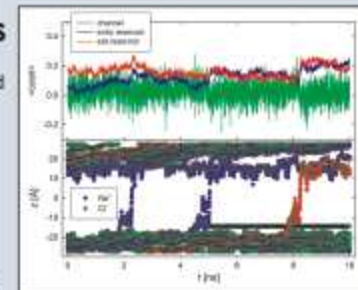
Potential

Solution of Poisson's equation for ensemble-averaged mesh based charge distribution in reciprocal space – using FFT



Ion passages

- Increased water polarization followed by relaxation
- Polarization angle θ between the water dipole and the channel axis
- Polarization in the channel: large fluctuations, quick relaxation, reversed sign after ion passage





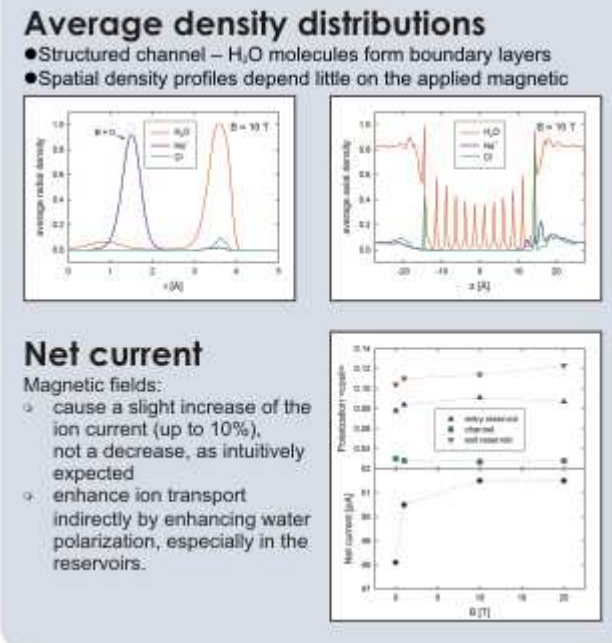
Secțiunile unui poster și conținutul lor

Rezultate

Textul în sine este recomandabil să nu depășească **200 de cuvinte** (exceptând textele asociate figurilor).

Imaginile pot fi salvate economic în format **JPG**, **TIF** sau **PNG**, primul fiind recomandabil pentru fotografii.

Pentru grafice și diagrame în care sunt preponderente liniile, este preferabil formatul PNG.





Secțiunile unui poster și conținutul lor

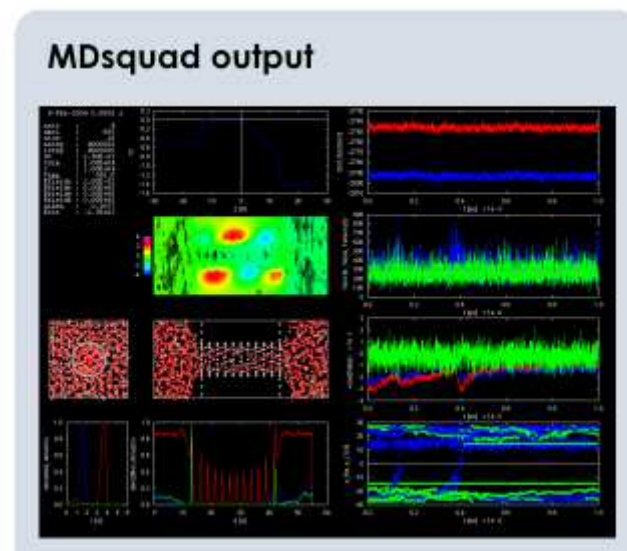
Rezultate

În cazul fotografiilor trebuie **evitate rezoluțiile nejustificat de mari.**

Fotografiile color obișnuite (13 x 18 cm la 180 dpi) cresc mărimea fișierului cu aproximativ 3 MB.

Trebuie utilizate imagini cu cel puțin **150 dpi**, dar nu mai mult de **350 dpi**.

Imaginile descărcate de pe internet nu au de obicei rezoluție satisfăcătoare (72dpi).





Secțiunile unui poster și conținutul lor

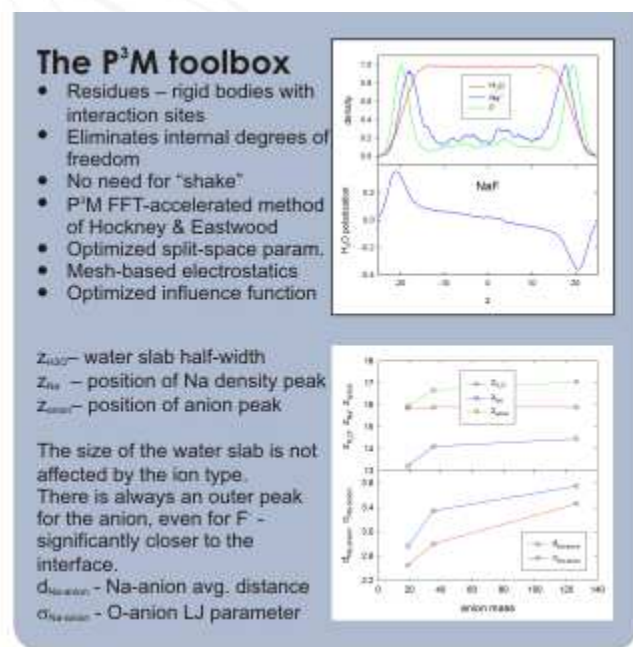
Rezultate

Pentru reprezentări grafice este recomandabilă utilizarea unor aplicații specializate (SigmaPlot, Origin etc.)

Aparenta versatilitate a aplicațiilor nespecializate se repercutează negativ asupra calității științifice / grafice.

Imaginile fără scală sau descriere rămân lipsite de semnificație.

Mărimea adecvată a fontului textelor care însoțesc graficele este





Secțiunile unui poster și conținutul lor

Concluzii

Secțiunea trebuie să treacă în revistă succint **rezultatele** și să precizeze dacă acestea susțin **ipotezele**.

Trebuie scoase în evidență **semnificația și interesul pe care îl prezintă rezultatele**, relația lor cu alte cercetări și direcțiile noi pe care le deschid.

Secțiunea trebuie limitată la cel mult **300 de cuvinte**.



Secțiunile unui poster și conținutul lor

Referințe bibliografice

Lista referințelor bibliografice care susțin rezultatele prezentate în lucrare este bine să nu depășească **5-10 titluri** și să respecte **regulile standardizate de formatare**.

Indicarea unor pagini web sau a altor materiale „volatile” este acceptabilă doar dacă acestea se bucură de recunoaștere în comunitatea științifică.



Secțiunile unui poster și conținutul lor

Mulțumiri

Este obligatorie menționarea **instituțiilor** care au **finanțat cercetarea**.

Se impune exprimarea de mulțumiri și față de **persoane** care au avut **contribuții directe sau indirecte** (discuții lămuritoare, punerea la dispoziție de echipamente, asistență tehnică etc.), dar care nu le conferă calitatea de coautori.

Mulțumirile nu trebuie să depășească **40 de cuvinte**.



Evitarea greșelilor uzuale

- Cea mai frecventă greșeală – poster prea încărcat.
- Regula de aur este „**Less is best**” – posterul nu poate fi exhaustiv.
- Titlul trebuie să fie atractiv și incisiv. Poate fi pretențios sau să implice o notă de umor. Exagerarea este însă detrimentală.
- Trebuie evitate titlurile care conțin caracterul „:”. Ele nu sunt nicidecum mai clare, ci doar, statistic, mai lungi.
- Formatarea textului trebuie să fie de tip propoziție. Nu trebuie capitalizat nici fiecare cuvânt, nici întregul titlu.
- Secțiunile nu trebuie numerotate sau punctate, întrucât utilizarea unor tipuri diferite de font este suficientă pentru demarcare.
- Lățimea casetelor de text nu trebuie să depășească 40 de caractere, permîtînd astfel parcurgerea rapidă a textului.



Evitarea greșelilor uzuale

- Trebuie evitate blocurile de text formate din mai mult de **2-3 propoziții**. Sunt preferabile, în loc, **listele**, eventual punctate.
- Este recomandabilă utilizarea unui font „non-serif” pentru titluri (Arial, Calibri) și a unui font „serif” pentru text (Times New Roman etc.)
- Pentru a scoate în evidență porțiuni de text, este preferabilă utilizarea **caracterelor italice** sau **bold** în locul sublinierii.
- **Calitatea elementelor grafice este esențială** pentru captarea atenției.
- **Graficele nu trebuie să aibă fundaluri colorate**, deoarece acestea sporesc senzația de „încărcat”.
- Utilizarea culorii: **2-3 culori**, nu mai mult! Culoarea scrisului trebuie să se detașeze de pe fundal, dar sunt **de evitat combinațiile stridente**.
- Informații utile la <http://www.colorschemer.com/online.html>



Evitarea greșelilor uzuale

- Nu trebuie uitate niciodată **sursele de finanțare**, acestea trebuind menționate explicit în secțiunea de „Mulțumiri”.
- Trebuie incluse (de obicei în subsolul posterului) toate **informațiile de contact**: adresă poștală, telefon, e-mail.
- Chiar dacă formulările pot fi eliptice, **textul trebuie să fie impecabil din punct de vedere lingvistic** – utilizarea unui speller.
- Sunt recomandabile **formulări simple și proprii dpdv științific**, pentru a transmite optim informația și a nu da impresia unui exercițiu lingvistic.
- Este o bună practică pregătirea prealabilă temeinică a unei **prezentări succinte de 3-5 minute** a posterului.
- Este utilă pregătirea unei versiuni a posterului sub formă de **broșură**, care poate fi distribuită.



Prezentarea posterului

- Pentru a atrage privitori, **ținuta și întreaga atitudine** este bine să fie adecvată temei, stilului și coloristicii poster-ului.
- Trebuie evitate **obiectele vestimentare și accesoriile stridente**. Trebuie evitate produsele cosmetice cu miros prea puternic.
- Atitudinea trebuie să manifeste **profesionalism și disponibilitate**.
- **Ecusonul** trebuie să fie la vedere și să fie ușor lizibil, astfel încât posibilul privitor să asocieze o **identitate personală posterului**.
- Nu trebuie mestecată gumă – degajarea nu trebuie “compusă”, ci trebuie să rezulte din stăpânirea temei.
- În timpul explicațiilor **nu trebuie consultate notițe**, iar **adresarea trebuie să fie directă** ascultătorului.
- Prezentarea în engleză trebuie **temeinic pregătită** și repetată în prealabil – **calitatea limbii vorbite** este de multe ori un factor determinant.



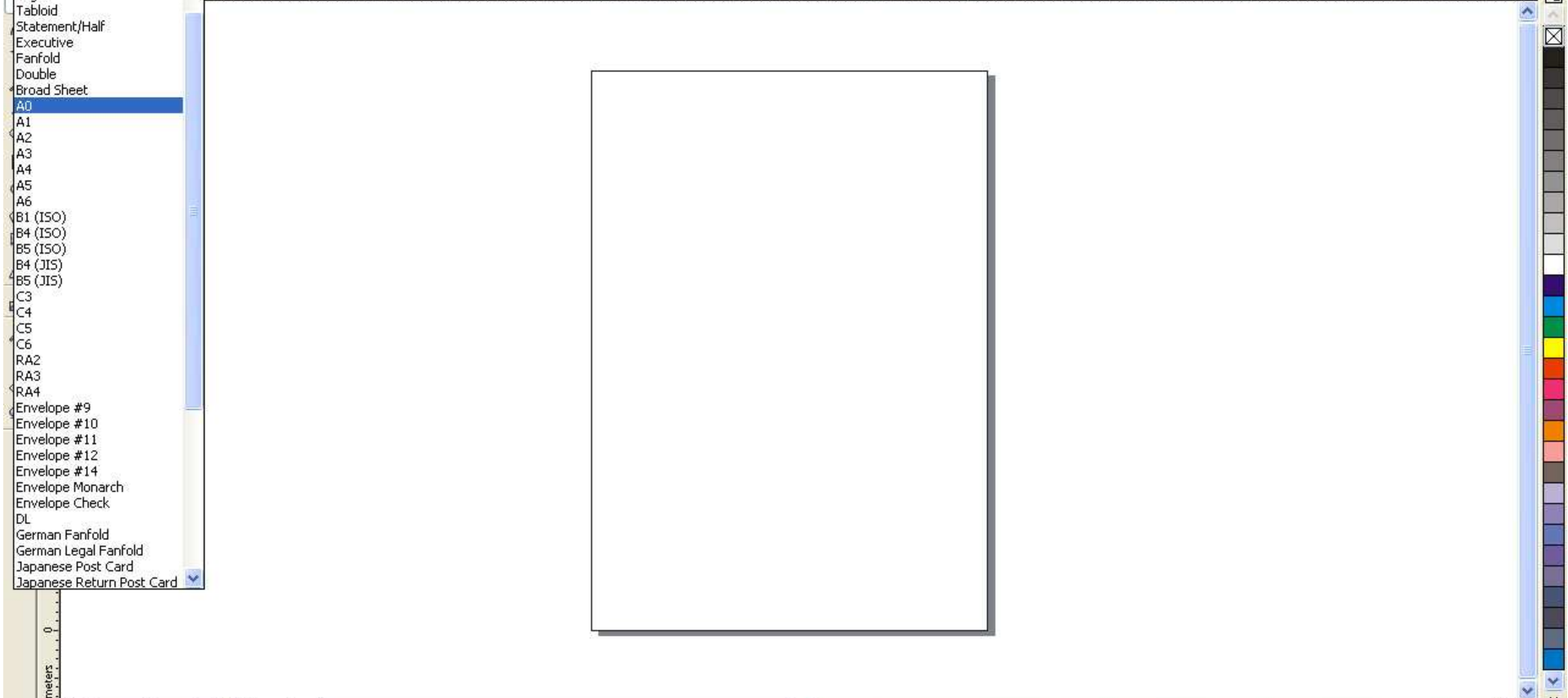
Prezentarea posterului

- Este util ca prezentarea să înceapă cu **o singură propoziție** care să **sintetizeze** esența lucrării înainte de a intra în detalii.
- Trebuie **evitate exprimările vagi**, gen „acest grafic reprezintă principalul nostru rezultat” și utilizate, în schimb, **formulări precise**, gen „acest grafic reprezintă dependența căutată a curentului ionic de raza porului”.
- Trebuie **evitate stereotipurile lingvistice** gen “you know” – formule de umplură care crează debit verbal, dar trădează sărăcia vocabularului.
- Dacă în timpul prezentării se adaugă nou veniți, trebuie terminată mai întâi prezentarea începută.
- Este util să existe la îndemână **reprinturi** ale articolelor personale relevante.
- Prezentarea trebuie încheiată cu **mulțumiri** adresate vizitatorilor.



Lucrări utile

- Purrington, C.B. 2009. Advice on designing scientific posters. <http://www.swarthmore.edu/NatSci/cpurri1/posteradvice.htm>.
- Block, S. 1996. The DOs and DON'Ts of poster presentation. *Biophysical Journal* 71:3527-3529.
- Briscoe, M.H. 1996. *Preparing Scientific Illustrations: A Guide to Better Posters, Presentations, and Publications*, 2nd ed. Springer-Verlag, New York. [[preview via Google Books](#)]
- Day, R.A. 2006. *How To Write and Publish a Scientific Paper*, 6th ed. Oryx Press, Phoenix. [[Amazon](#)]
- Wolcott, T.G. 1997. Mortal sins in poster presentations or, How to give the poster no one remembers. *Newsletter of the Society for Integrative and Comparative Biology* Fall:10-11.





CorelDRAW X3 - [Graphic1]

File Edit View Layout Arrange Effects Bitmaps Text Tools Window Help

100%

Units: millimeters 2.54 mm 6.35 mm 6.35 mm

400 200 0 200 400 600 800 1000 1200 1400 1600 1800 millimeters

1200 1000 800 600 400 200 0 millimeters

Page 1

(-238.325, 1385.609) Next click for Drag/Scale; Second click for Rotate/Skew; Dbl-clicking tool selects all objects; Shift+click multi-selects; Alt+click digs

start CorelDRAW X3 - [Gra... Corel PHOTO-PAINT X3 EN 22:50

The image shows the CorelDRAW X3 software interface. The 'View' menu is open, displaying options such as 'Simple Wireframe', 'Wireframe', 'Draft', 'Normal', 'Enhanced', and 'Enhanced with Overprints'. The 'Guidelines Setup...' option is highlighted, with a tooltip 'Guideline Setup' appearing next to it. The main workspace contains a large, empty rectangular frame. The interface includes a top menu bar, a toolbar on the left, a status bar at the bottom, and a Windows taskbar at the very bottom.



Options

Vertical

840.000 millimeters

0.000
15.000
275.000
290.000
550.000
565.000
825.000
840.000

Add
Move
Delete
Clear

OK Cancel Help



CorelDRAW X3 - [Graphic1]

File Edit View Layout Arrange Effects Bitmaps Text Tools Window Help

x: 420.5 mm y: -1100.0 mm 0.0 420.5 mm -1100.0 mm 100%

1000 800 600 400 200 0 200 400 600 800 1000 1200 1400 1600 1800 millimeters

Options

- Workspace
- Document
 - General
 - Page
 - Guidelines
 - Horizontal
 - Vertical
 - Guides
 - Presets
 - Grid
 - Rulers
 - Styles
 - Save
 - Publish To The Web
- Global
 - Show Guidelines
 - Snap To Guidelines

Horizontal

-1100.000 millimeters

Add

Move

Delete

Clear

-1100.000

-120.000

-105.000

0.000

OK Cancel Help

1 of 1 Page 1

Guideline on Guides

(-375.797, 194.015) Click an object twice for rotating/skewing; dbl-clicking tool selects all objects; Shift+click multi-selects; Alt+click dics; Ctrl+click selects in a group

None

R:0 G:0 B:255 0.000 millimeter

start CorelDRAW X3 - [Gra... Corel PHOTO-PAINT X3 EN 23:15



CorelDRAW X3 - [Graphic1]

File Edit View Layout Arrange Effects Bitmaps Text Tools Window Help

x: 420,5 mm
y: -1100,0 mm

100%

400 200 0 200 400 600 800 1000 1200 1400 1600 1800 millimeters

- Simple Wireframe
- Wireframe
- Draft
- Normal
- Enhanced
- Enhanced with Overprints
- Full-Screen Preview F9
- Preview Selected Only
- Page Sorter View
- ✓ Rulers
- Grid
- ✓ Guidelines
 - Show
 - Enable Rollover
- Snap to Grid Ctrl+Y
- ✓ Snap to Guidelines Snap to Guidelines
- ✓ Snap to Objects Alt+Z
- Dynamic Guides Alt+Shift+D
- Grid and Ruler Setup...
- Guidelines Setup...
- Snap to Objects Setup...
- Dynamic Guides Setup...

millimeters 100 200 400 600 800 1000 1200

Page 1

Guideline on Guides

(-884.181, 191.421) Click an object twice for rotating/skewing; dbl-clicking tool selects all objects; Shift+click multi-selects; Alt+click digs; Ctrl+click selects in a group

None

R:0 G:0 B:255 0.000 millimeter

start

CorelDRAW X3 - [Gra... Corel PHOTO-PAINT X3

EN 23:17

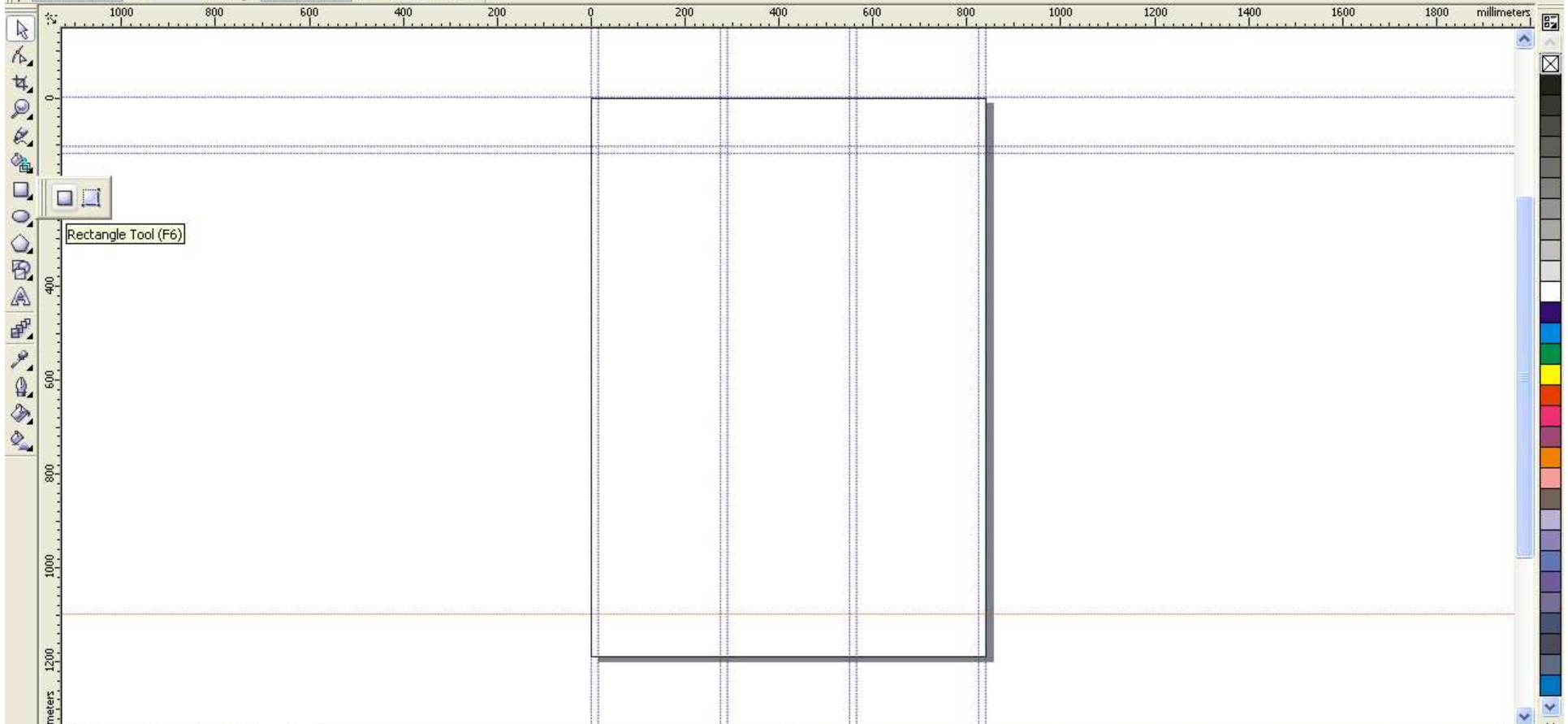


CorelDRAW X3 - [Graphic1]

File Edit View Layout Arrange Effects Bitmaps Text Tools Window Help

100%

x: 420.5 mm y: -1100.0 mm 0.0 420.5 mm -1100.0 mm



Page 1

Guideline on Guides

(-1174.687, -241.7... Click an object twice for rotating/skewing; dbl-clicking tool selects all objects; Shift+click multi-selects; Alt+click digs; Ctrl+click selects in a group

None R:0 G:0 B:255 0.000 millimeter

start CorelDRAW X3 - [Gra... Corel PHOTO-PAINT X3 EN 23:18

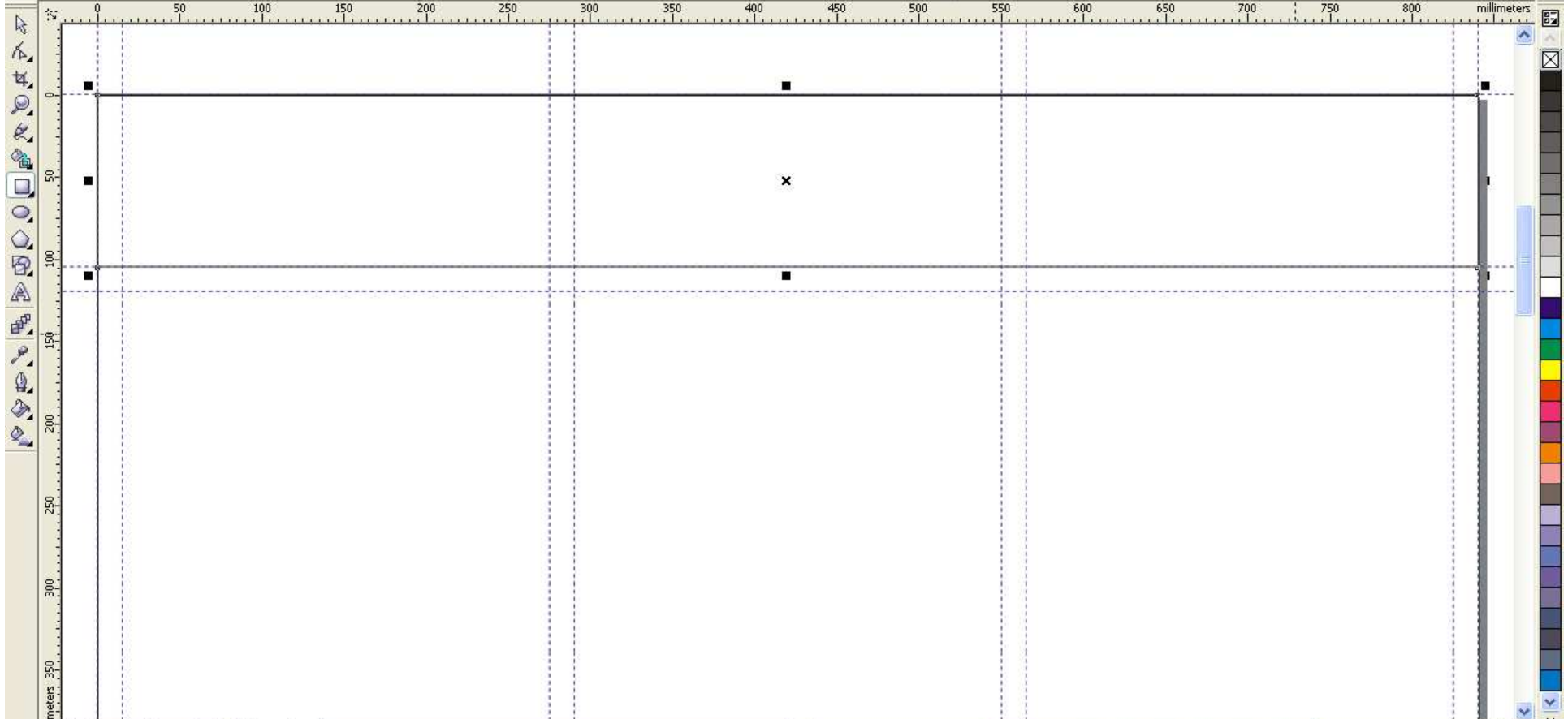


CorelDRAW X3 - [Graphic1]

File Edit View Layout Arrange Effects Bitmaps Text Tools Window Help

350%

X: 420.0 mm Y: -52.5 mm Width: 840.0 mm Height: 105.0 mm Hairline



1 of 1 Page 1

Width: 840.000 Height: 105.000 Center: (420.000, -52.500) millimeters Rectangle on Layer 1
(728.839, -146.074) Dbl-click tool creates a page frame; Ctrl+drag constrains to a square; Shift+drag draws from center

start CorelDRAW X3 - [Gra... Corel PHOTO-PAINT X3 EN 23:22



CorelDRAW X3 - [Graphic1]

File Edit View Layout Arrange Effects Bitmaps Text Tools Window Help

350%

X: 420.0 mm Y: -52.5 mm Width: 840.0 mm Height: 105.0 mm 100.0% 0.0 Hairline

The workspace displays a page frame with a width of 840.0 mm and a height of 105.0 mm. The center point is at (420.000, -52.500) millimeters. A central crosshair is visible. The workspace includes a ruler at the top and left, and a color palette on the right.

Width: 840.000 Height: 105.000 Center: (420.000, -52.500) millimeters Rectangle on Layer 1
(840.000, -381.034) Dbl-click tool creates a page frame; Ctrl+drag constrains to a square; Shift+drag draws from center

start CorelDRAW X3 - [Gra... Corel PHOTO-PAINT X3 EN 23:24



CorelDRAW X3 - [Graphic1]

File Edit View Layout Arrange Effects Bitmaps Text Tools Window Help

350%

x: 420.0 mm y: -52.5 mm 840.0 mm 105.0 mm 100.0 % 0.0 Hairline

0 50 100 150 200 250 300 350 400 450 500 550 600 650 700 750 800 millimeters

Uniform Fill

Models Mixers Palettes

Model: RGB

Reference

Old: [Black swatch]

New: [Blue swatch]

Components

R	0	R	0
G	51	G	51
B	102	B	102

Name:

Add To Palette Options OK Cancel Help

Width: 840.000 Height: 105.000 Center: (420.000, -52.500) millimeters Rectangle on Layer 1 (751.816, -379.552) Click an object twice for rotating/skewing; dbl-clicking tool selects all objects; Shift+click multi-selects; Alt+click digs; Ctrl+click selects in a group

start CorelDRAW X3 - [Gra... Corel PHOTO-PAINT X3 EN 23:27



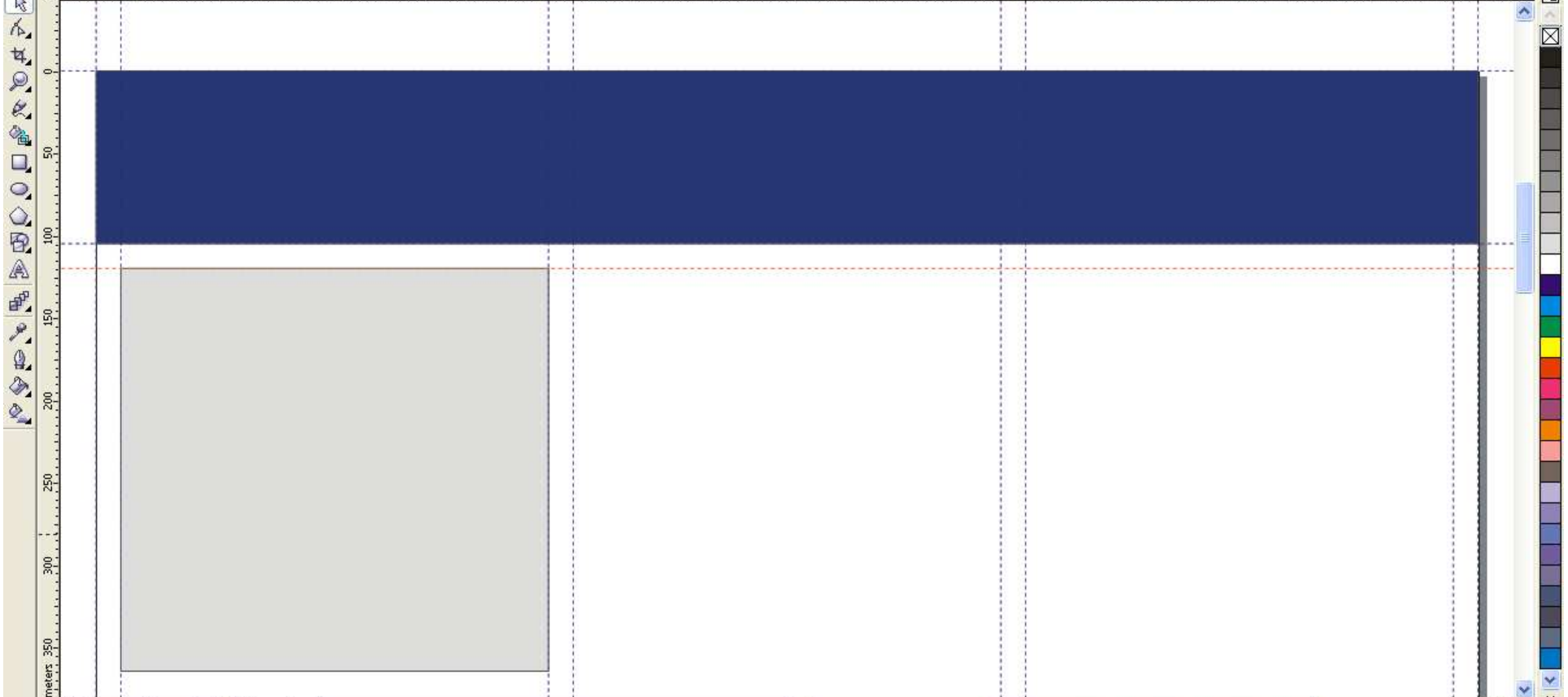
CorelDRAW X3 - [Graphic1]

File Edit View Layout Arrange Effects Bitmaps Text Tools Window Help

350%

x: 420.5 mm y: -120.0 mm 0.0 420.5 mm -120.0 mm

0 50 100 150 200 250 300 350 400 450 500 550 600 650 700 750 800 millimeters



1 of 1 Page 1

Guideline on Guides

(435.324, -281.714) Click an object twice for rotating/skewing; dbl-clicking tool selects all objects; Shift+click multi-selects; Alt+click dics; Ctrl+click selects in a group

None Blue 0.000 millimeters

start CorelDRAW X3 - [Gra... Corel PHOTO-PAINT X3 EN 23:35



CorelDRAW X3 - [Graphic1]

File Edit View Layout Arrange Effects Bitmaps Text Tgols Window Help

New Ctrl+N
New From Template...
Open... Ctrl+O
Close
Close All
Save... Ctrl+S
Save As... Ctrl+Shift+S
Revert
Acquire Image
Import... Ctrl+I Import (Ctrl+I)
Export... Ctrl+E
Export For Office...
Send To
Print... Ctrl+P
Print Merge
Print Preview...
Print Setup...
Prepare For Service Bureau...
Publish To The Web
Publish To PDF...
Document Info...
1 D:\Documents\...\CCP2007.cdr
2 UBB_logo_blue.cdr
3 _logo.cdr
4 UBB_logo_blue_text.cdr
5 D:\Imaging\...\UBB_logo.cdr
Exit Alt+F4

350%

150 200 250 300 350 400 450 500 550 600 650 700 750 800 millimeters

millimeters 350

1 of 1 Page 1

Guideline on Guides

(-7.914, 50.344) Click an object twice for rotating/skewing; dbl-clicking tool selects all objects; Shift+click multi-selects; Alt+click digs; Ctrl+click selects in a group

None
Blue 0.000 millimeters

start CorelDRAW X3 - [Gra... Corel PHOTO-PAINT X3 EN 23:38



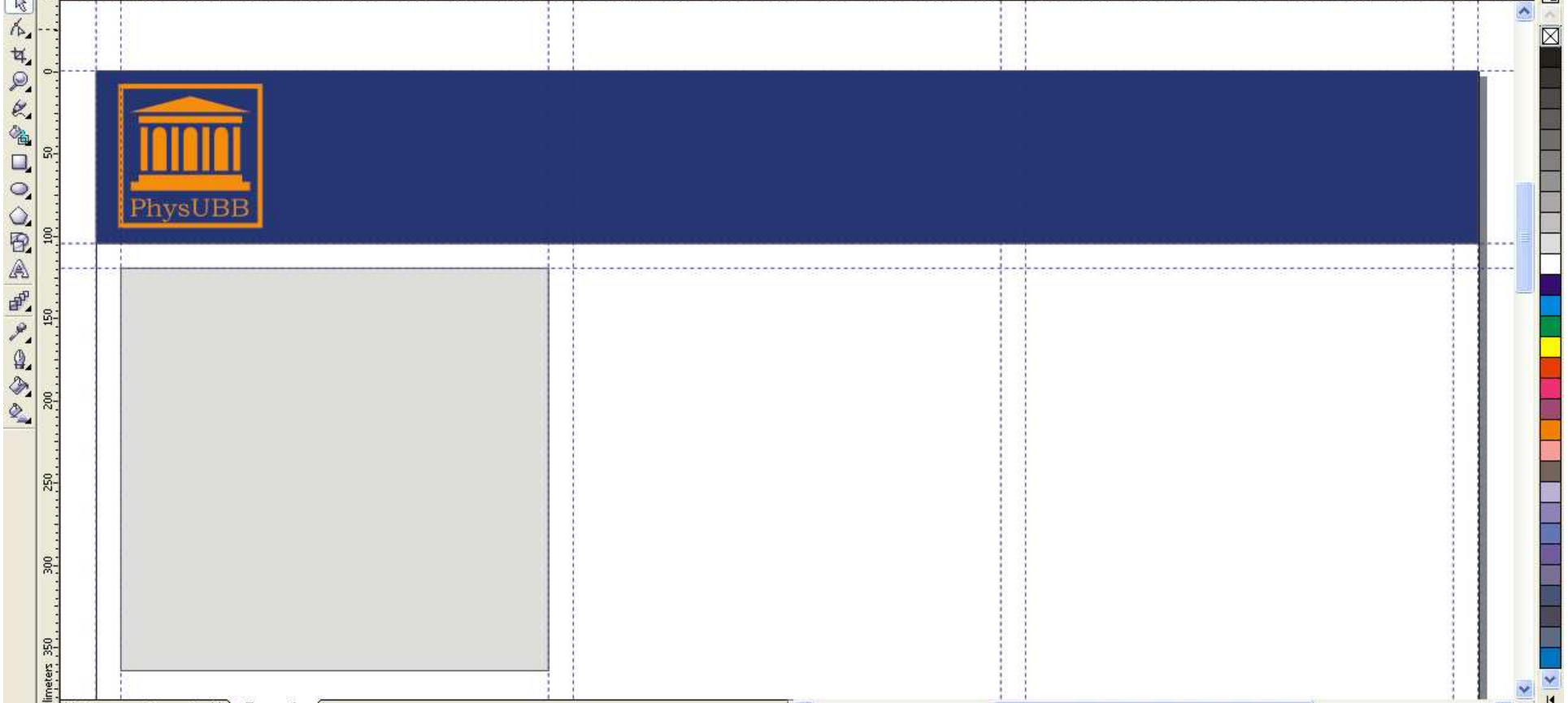
CorelDRAW X3 - [Graphic1]

File Edit View Layout Arrange Effects Bitmaps Text Tools Window Help

350%

A0 841.0 mm 1189.0 mm Units: millimeters 2.54 mm 6.35 mm 6.35 mm

0 50 100 150 200 250 300 350 400 450 500 550 600 650 700 750 800 millimeters



1 of 1 Page 1

(353.792, 25.143) Next click for Drag/Scale; Second click for Rotate/Skew; Dbl-clicking tool selects all objects; Shift+click multi-selects; Alt+click digs



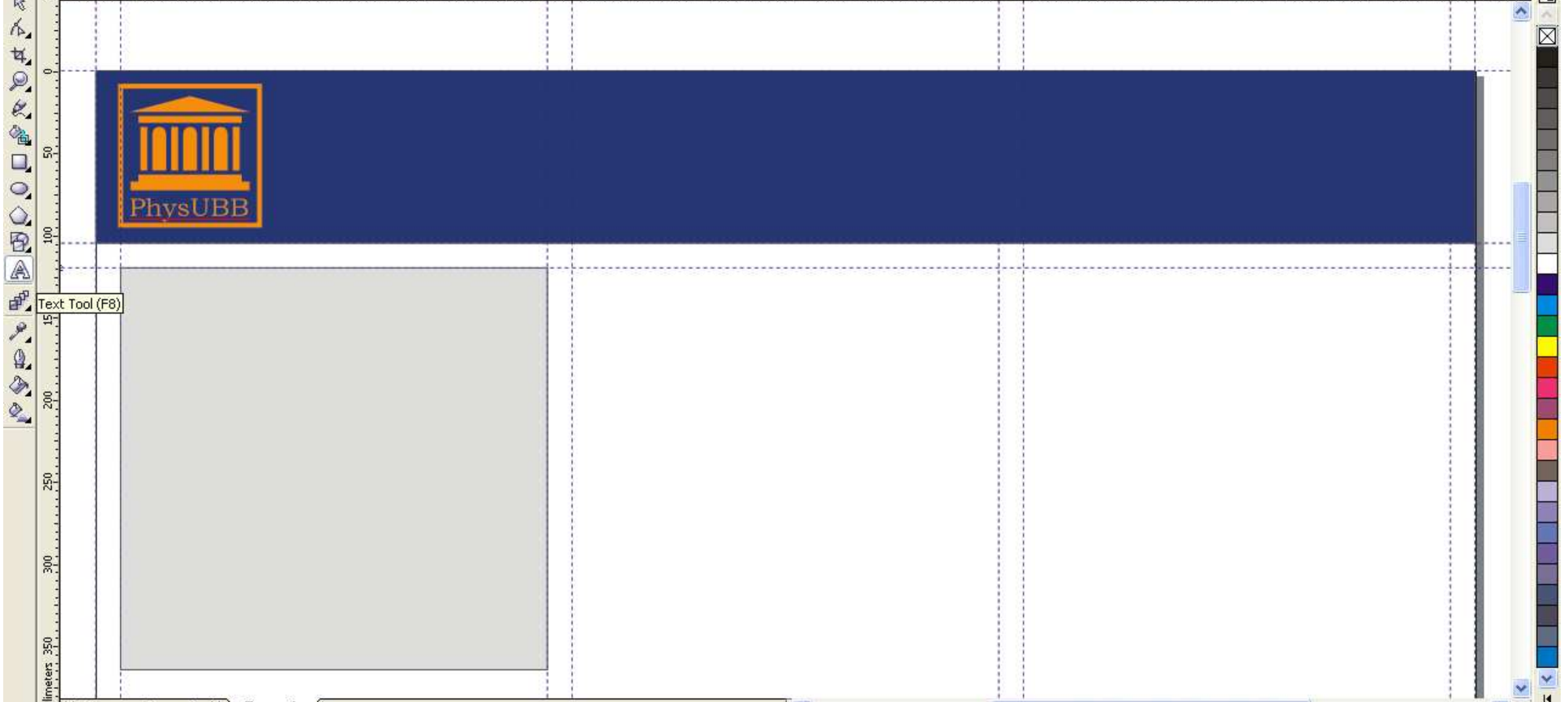
CorelDRAW X3 - [Graphic1]

File Edit View Layout Arrange Effects Bitmaps Text Tools Window Help

350%

x: 420.5 mm y: -594.5 mm 0.0 mm 0.0 mm 0.0 Arial 24 pt B I U

0 50 100 150 200 250 300 350 400 450 500 550 600 650 700 750 800 millimeters



1 of 1 Page 1

(-42.750, -120.000) Click+drag adds Paragraph Text



CorelDRAW X3 - [Graphic1]

File Edit View Layout Arrange Effects Bitmaps Text Tools Window Help

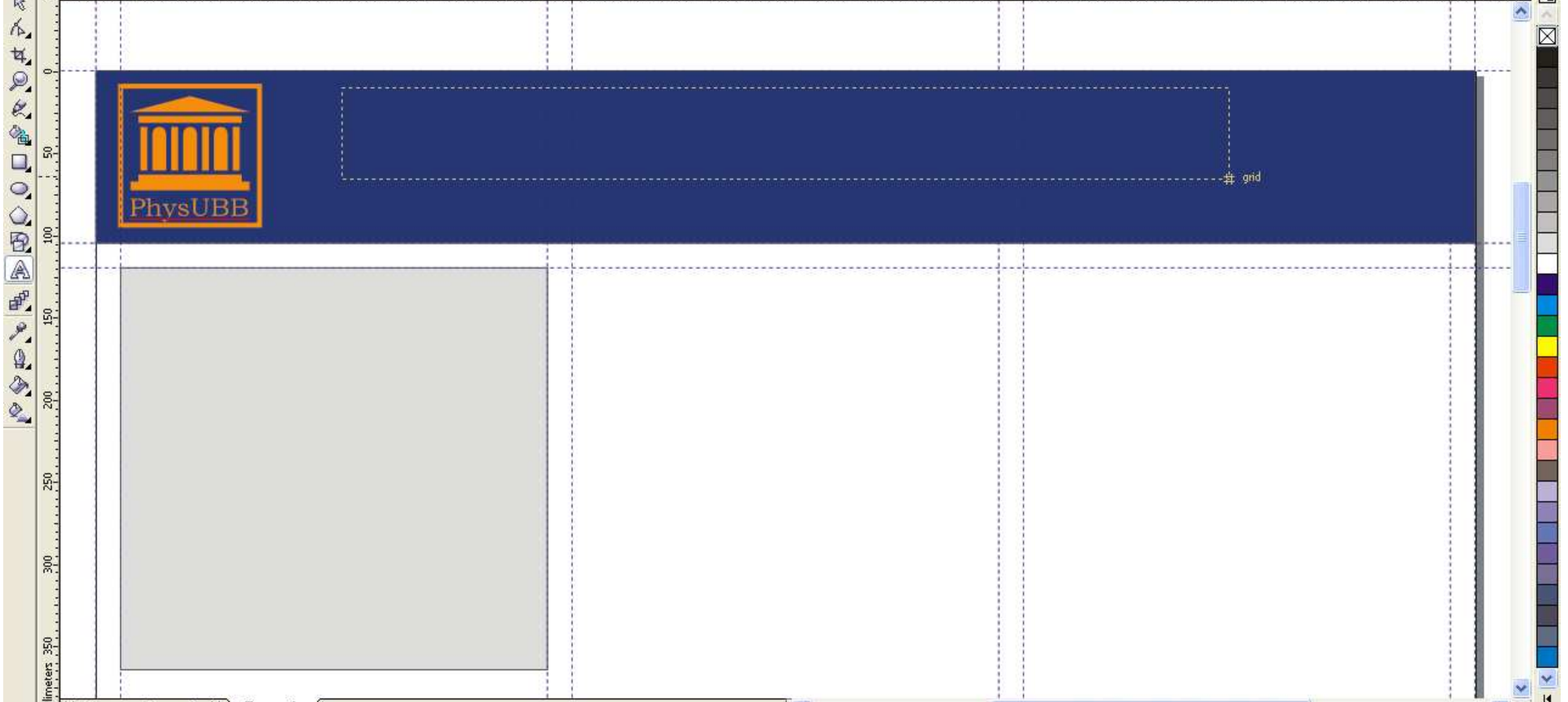
350%

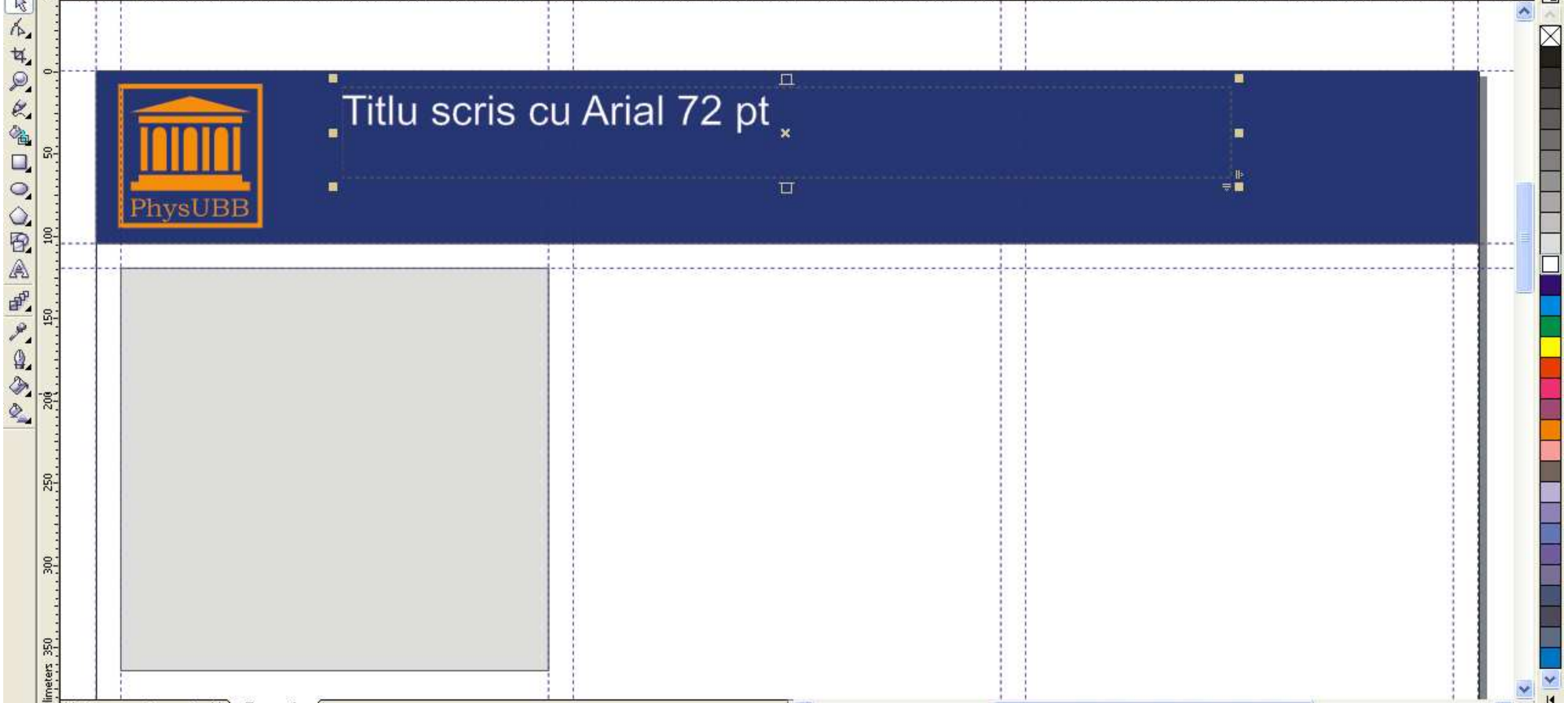
x: 420.5 mm y: -594.5 mm 0.0 mm 0.0 mm 0.0 Arial 24 pt B I U

0 50 100 150 200 250 300 450 500 550 600 650 700 750 800 millimeters

1 of 1 Page 1

(390.111, 57.015) Click+drag adds Paragraph Text







CorelDRAW X3 - [Graphic1]

File Edit View Layout Arrange Effects Bitmaps **Text** Tools Window Help

Character Formatting Ctrl+T
Paragraph Formatting
Paragraph Formatting

Character Formatting Ctrl+T
Paragraph Formatting
Paragraph Formatting

Paragraph Formatting

abj

2 pt

Titlu s

PhysUBB

Width: 540.000 Height: 55.000 Center: (420.000, -37.500) millimeters
Paragraph Text: Arial (Normal) (ENU) on Layer 1
(672.508, 48.862) Click an object twice for rotating/skewing; dbl-clicking tool selects all objects; Shift+click multi-selects; Alt+click digs; Ctrl+click selects in a group

start CorelDRAW X3 - [Gra... Corel PHOTO-PAINT X3 EN 23:56



Titlu scris cu Arial 72 pt

PhysUBB

Paragraph Formatting

Alignment	
Horizontal	None
Vertical	None
Spacing	Center
Indents	None



Titlu scris centrat cu Arial 72 pt

PhysUBB

Paragraph Formatting

Alignment

Horizontal: Center

Vertical: Top

Spacing

Indents



Titlu scris centrat cu Arial 72 pt

Nume scris centrat cu 48 pt

PhysUBB

Paragraph Formatting

Alignment

Horizontal: Center

Vertical: Top

Spacing

Indents



Titlu scris centrat cu Arial 72 pt

Nume scris centrat cu 48 pt

Subtitlu scris cu 36 pt

Text scris cu 24 pt Text scris cu 24 pt Text scris cu 24 pt Text scris cu 24 pt Text scris cu 24 pt Text scris cu 24 pt Text scris cu 24 pt Text scris cu 24 pt Text scris cu 24 pt Text scris cu 24 pt Text scris cu 24 pt Text scris cu 24 pt Text scris cu 24 pt Text scris cu 24 pt

Character Formatting

Arial

Normal

Range Kerning:

Character Effects

Underline (none)

Strikethru (none)

Overline (none)

Uppercase (none)

Position (none)

Character Shift

Angle

Horizontal Shift

Vertical Shift